IN THE

Supreme Court of the United States

OCTOBER TERM, 1977

No. 77-1283

KREKEL KARCH,

Petitioner,

vs.

THE UNITED STATES,

Respondent.

PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF CLAIMS

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The petitioner, KREKEL KARCH, respectfully requests that a writ of certiorari issue to review the opinion and judgment of the United States Court of Claims rendered in these proceedings on December 14, 1977.

OPINION BELOW

The opinion of the United States Court of Claims, as yet unreported, appears at the Appendix hereto, *infra*, pp. 1a-13a.

JURISDICTION

The judgment of the United States Court of Claims was entered on December 14, 1977. See Appendix, pp. 1a-13a, *infra*. This petition for certiorari was filed within 90 days of that date. The jurisdiction of this Court is invoked under 28 U.S.C., Sec. 1255(1).

QUESTIONS PRESENTED

I.

WHETHER A CRITICAL AND EFFICACIOUS STEP IN A PROCESS PATENT, PREVIOUSLY UNMENTIONED IN THE PRIOR ART AND ADMITTEDLY NOVEL, MUST NECESSARILY BE NON-OBVIOUS UNDER 35 U.S.C., SEC. 103.

II.

WHETHER THE COURT OF CLAIMS ERRED IN INTERPRETING THIS COURT'S FACTORS IN EVALUATING VALIDITY UNDER 35 U.S.C., SEC. 103, (NON-OBVIOUSNESS), WHEN THE COURT FOUND THAT THE CRITICAL NEW ELEMENT OF GAUGING OR RESTRICTING RATE OF WATER DISCHARGE TO A SPECIFIED AND ADMITTEDLY EFFICACIOUS RATE OF FLOW WAS NOVEL UNDER 35 U.S.C., SEC. 102, BUT THE COURT THEN FOUND THIS CRITICAL STEP, PREVIOUSLY UNMENTIONED IN THE PRIOR ART, TO BE "OBVIOUS" UNDER 35 U.S.C., SEC. 103.

III.

WHAT IS THE INTERRELATIONSHIP BETWEEN *NOVELTY* AS AN ELEMENT OF *PATENTABILITY* UNDER SEC. 102, AND THE DEGREE OF SUBSTANTIVE NOVELTY AS A "*DIFFERENCE* FROM PRIOR ART" AS AN ELEMENT OF *OBVIOUSNESS* UNDER SEC. 103? SPECIFICALLY, WHETHER IN A PROCESS PATENT FOR SOIL CONSERVATION, ADDING THE CRITICAL ADDITIONAL RESTRICTION OF A SPECIFIED AND ADMITTEDLY EFFICACIOUS RATE OF FLOW OF DISCHARGE WATER IS A SIGNIFICANTLY DIFFERENT STEP, NOT ONLY TO DISTINGUISH THE PATENT ON THE BASIS OF COURT-FOUND NOVELTY, BUT ALSO TO MAKE THE PATENT NON-OBVIOUS IN VIEW OF PRIOR ART TOTALLY SILENT ON THE SUBJECT OF CONTROL OF THE RATE OF FLOW.

IV.

WHETHER THE "SECONDARY CONSIDERATIONS" ADMITTED BY THE COURT TO BE FOUND BY THE EVIDENCE ARE FURTHER EVIDENCE OF NON-OBVIOUSNESS, PARTICULARLY IN THE LIGHT OF THEIR DRAMATIC SHOWING OF GOVERNMENT MISCONDUCT, IN THE ATTEMPTS OF GOVERNMENT AGENTS TO SUPPRESS AND BELITTLE THE PLAINTIFF'S INVENTION, BY OFFICIAL ACTION UNSUCCESSFULLY TO UNDERMINE THE PATENT'S COMMERCIAL SUCCESS, AND WHEN ALL THESE FAILED, THE CLAIM BY U.S. GOVERNMENT EMPLOYEES THAT THE INVENTION WAS THEIR OWN.

V.

WHETHER THE UNITED STATES OF AMERICA AS A DEFENDANT IN A PATENT SUIT IS LIABLE FOR TREBLE DAMAGES FOR ACTIVELY INDUCING INFRINGEMENT OF A PATENT UNDER 35 U.S.C., SEC. 271(b).

VI.

WHETHER THE UNITED STATES OF AMERICA IS BY THE ACTS OF ITS AGENTS IN GRANTING A PATENT ESTOPPED FROM PURSUING COLLATERALLY THE ISSUE OF NON-VALIDITY OF THE PATENT, AND THE DOCTRINE OF *RES JUDICATA* IS APPLICABLE.

CONSTITUTIONAL AND STATUTORY PROVISIONS INVOLVED

The Constitution of the United States, Article I, Sec. 8, Clause 8:

> "The Congress shall have power . . . to promote the progress of science and the useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries. . . ."

28 U.S.C., Sec. 1255. Court of Claims; certiorari; certified questions

> "Cases in the Court of Claims may be reviewed by the Supreme Court by the following methods:
> (1) By writ of certiorari granted on petition of the United States or the claimant; . . . ."

28 U.S.C., Sec. 1498. Patent and copyright cases

> "(a) Whenever an invention described in and covered by a patent of the United States is used or manufactured by or for the United States without license of the owner thereof or lawful right to use or manufacture the same, the owner's remedy shall be by action against the United States in the Court of Claims for the recovery of his reasonable and entire compensation for such use and manufacture.
>
> "For the purposes of this section, the use or manufacture of an invention described in and covered by a patent of the United States by a contractor, a subcontractor, or any person, firm, or corporation for the Government and with the authorization or consent of the Government, shall be construed as use or manufacture for the United States. . . ."

35 U.S.C., Sec. 102. Conditions for patentability; novelty and loss of right to patent

"A person shall be entitled to a patent unless—
(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or
(c) he has abandoned the invention, or
(d) the invention was first patented or caused to be patented by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application filed more than twelve months before the filing of the application in the United States, or
(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or
(f) he did not himself invent the subject matter sought to be patented, or
(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other. July 19, 1952, c. 950, Sec. 1, 66 Stat."

Amendment to Sec. 102(d) and (e), July 28, 1972:

"(d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed

more than twelve months before the filing of the application in the United States, or
"(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent, or. . . .
As amended July 28, 1972, Pub.L. 92-358, Sec. 2, 86 Stat. 502; Nov. 14, 1975, Pub.L. 94-131, Sec. 5, 89 Stat. 691."

35 U.S.C., Sec. 103. Conditions of patentability; non-obvious subject matter

"A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made. July 19, 1952, c. 950, Sec. 1, 66 Stat. 798."

35 U.S.C., Sec. 112. Specification

"The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

"The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

"An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof. July 19, 1952, c. 950, sec. 1, 66 Stat. 798."

Sec. 112, Amended, July 24, 1965:

"Sec. 112. Specification

"The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

"The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

"A claim may be written in independent or, if the nature of the case admits, in dependent or multiple dependent form.

"Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

"A claim in multiple dependent form shall contain a reference, in the alternative only, to more than one claim previously set forth and then specify a further limitation of the subject matter claimed. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. A

multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.

"An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specifications and equivalents thereof.

As amended July 24, 1965, Pub.L. 89-93, Sec. 9, 79 Stat. 261; Nov. 14, 1975, Pub.L. 94-131, Sec. 7, 89 Stat. 691."

Sec. 271. Infringement of patent

"(a) Except as otherwise provided in this title, whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, infringes the patent.

"(b) Whoever actively induces infringement of a patent shall be liable as an infringer.

"(c) Whoever sells a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.

"(d) No patent owner otherwise entitled to relief for infringement or contributory infringement of a patent shall be denied relief or deemed guilty of misuse or illegal extension of the patent right by reason of his having done one or more of the following: (1) derived revenue from acts which if performed by another without his consent would

constitute contributory infringement of the patent; (2) licensed or authorized another to perform acts which if performed without his consent would constitute contributory infringement of the patent; (3) sought to enforce his patent rights against infringement or contributory infringement. July 19, 1952, c. 950, Sec. 1, 66 Stat. 811."

35 U.S.C., Sec. 282. Presumption of validity; defenses

"A patent shall be presumed valid. The burden of establishing invalidity of a patent shall rest on a party asserting it.

"The following shall be defenses in any action involving the validity or infringement of a patent and shall be pleaded:

"(1) Noninfringement, absence of liability for infringement or unenforceability,

"(2) Invalidity of the patent or any claim in suit on any ground specified in part II of this title as a condition for patentability,

"(3) Invalidity of the patent or any claim in suit for failure to comply with any requirement of sections 112 or 251 of this title,

"(4) Any other fact or act made a defense by this title.

"In actions involving the validity or infringement of a patent the party asserting invalidity or noninfringement shall give notice in the pleadings or otherwise in writing to the adverse party at least thirty days before the trial, of the country, number, date, and page numbers of any publication to be relied upon as anticipation of the patent in suit, or, except in actions in the United States Court of Claims, as showing the state of the art, and the name and address of any person who may be relied upon as the prior inventor or as having prior knowledge of or as having previously used or offered for sale the invention of the patent in suit. In the absence of such notice proof of the said matters may not be made at the trial except on such terms as the

court requires. July 19, 1952, c. 950, Sec. 1, 66 Stat. 812."

Amendment to Sec. 282, first paragraph, November 14, 1975:

"Sec. 282. Presumption of validity; defenses

"A patent shall be presumed valid. Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim. The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity. . . . As amended No. 14, 1975, Pub.L. 94-131, Sec. 10, 89 Stat. 692."

STATEMENT OF THE CASE

Krekel Karch, a bulldozer operator and earth-moving contractor, by the process of trial and error while removing hedgerows and filling ditches for farmers in the post-World War II era, developed a process of soil conservation which he patented as U.S. Patent No. 2,-745,768, "Erosion and Flood Control and Land Reclamation," issued on May 15, 1956, on application of April 15, 1952.

This is a process or method patent. It sets forth a process, described by the former research director of the Watershed Hydrology Section of the Agricultural Research Service, Department of Agriculture, as "revolutionary and unorthodox" and "distinctly different," from any existing research or practice being conducted at the time of its invention.

Briefly stated, the method is the control of water and suspended soil run-off from the upper watershed fields where the rain first falls, by restricting the flow of run-off with a throttled orifice through an earthen barrier, retaining the silt-laden water on the fields themselves over a period of 12 to 48 hours, which effects the deposit of silt from the water, but following which the temporary retaining basin automatically empties dry and is thereby safely cultivatable. The brief period of standing water is not sufficiently lengthy to damage crops.

The critical element or step in the Karch process is the use of a major portion of the field in which the rain falls as a temporary retaining basin from which the water from a normal rainfall is discharged at a precisely measured rate: that is, that rate which is slow enough to permit the suspended silt to be deposited from the water, but at the same time fast enough so that normal

rainfalls do not remain upon the growing crops so long as to damage them.

Following extensive and elaborate testimony, including numerous expert witnesses and extensive review of the prior art, both patented and non-patented, the Court found that the prior art projects cited by the defendant "do not operate in the manner required of the claim in suit, and thus do not anticipate within the meaning of 35 U.S.C., Sec. 102(a)." (Pamphlet Decision, p. 7)

Nonetheless, the Court found the patent obvious in view of the prior art.

There was extensive and elaborate testimony on the matter of not only the prior art and the differences of the patented method or process, but also secondary considerations, particularly including the direct efforts of U.S. Government agents to belittle and suppress the plaintiff's invention, to undermine its commercial success, and finally to claim the invention to have been made by Government employees.

The plaintiff filed suit pursuant to 28 U.S.C., Sec. 1498, and following extensive pleadings the defendant withdrew its motion to dismiss "for the reason that the Government is confident in its other defenses relating to the invalidity of the patent and does not wish to expend further attorney time or necessary expense in pursuit the jurisdictional issue. . . ." Pursuant to defendant's motion, the Court ordered "that the defendant shall not raise the jurisdictional issue. . . . and evidence relating to the jurisdictional issues raised in said motions will not be received by the Court."

Petition for writ of certiorari to this Court is made pursuant to 28 U.S.C., Sec. 1255(1).

REASONS FOR GRANTING WRIT

I.

A CRITICAL AND EFFICACIOUS STEP IN A PROCESS PATENT, PREVIOUSLY UNMENTIONED IN THE PRIOR ART AND ADMITTEDLY NOVEL, MUST NECESSARILY BE NON-OBVIOUS UNDER 35 U.S.C. 103.

The insertion by Congress of the word "obvious" in the 1952 Patent Act, is a classic example of misnomer. The prior common-law interpretation of the pre-existing Patent Act, as well as subsequent court interpretation of the 1952 "obviousness" concept, makes it clear that the concept which Congress was attempting to embody is something quite different than that which springs to the layman's mind with the idea of what is "obvious." "Obviousness" is a mere subjective judgment, whether by the court or by a layman.

The history of the Patent Act, from its origin in Thomas Jefferson's early work as author and implementer of the original Patent Act, reveals an effort to distinguish between simple novelty and the substantive degree of innovation which was felt worthy of a patent.

In the case of a process or method patent, the ultimate result or the mechanical objects through which it is obtained may or may not, in and of themselves, be patentable. However, the essence of the process or method patent is that the combination of steps be new.

To the extent that a step in a process is critical, and achieves a new result, and to the extent that such a step is previously unmentioned in the prior art and admittedly novel, it is respectfully submitted, must necessarily be non-obvious under 35 U.S.C., Sec. 103.

In the present case, the critical and efficacious step provided by the Karch process patent was the *rate of flow* of normal rainfall from the farm field on which the rainfall originally fell, at such *restricted flow* so as to cause the deposit of suspended silt, and thus prevent erosion, but sufficiently rapidly enough that the temporarily retained standing water did not damage farm crops. After elaborate and extensive expert and documentary testimony, the Trial Court found that this critical formula step of the "proper" rate of flow for removal of rainwater was novel with Karch, and achieved the intended result. (Pamphlet Opinion, p. 7a)

Whatever might be the wisdom of hindsight in determining that such a rate of normal rainfall removal might be "obvious", in the context of a process for soil conservation, the original determination of such rate is, in the words of the plaintiff's expert witness, Dr. William C. Ackermann, "revolutionary and unorthodox." Dr. Ackermann was, during the two years immediately prior to the granting of the Karch patent, the director of all governmental research in the area covered by the Karch patent, in his position as head of the Watershed Hydrology Section of the Agricultural Research Service of the United States Department of Agriculture. (PX 102) He described the Karch patented method as "distinctly different" from any other research in the area of soil conservation, because of the determination of this remarkably effective and critical rate of water removal.

The essence of the concept which Congress misnamed "obviousness" is the importance or significance of the new element of invention. Perhaps a better phrase than "obviousness" is "*substantive* novelty"; that is, the importance or significance of the "difference" of the invention

from the prior art, as opposed to the mere existence of a difference.

It is this concept which Thomas Jefferson attempted to distinguish in his early correspondence on the degree of novelty necessary for patentability.

Thomas Jefferson has been called the "first administrator of our patent system" for his work as moving spirit and informal chairman of the three cabinet level officials who made up the "Commissioners for the Promotion of Useful Arts" established by the First Congress; he was also the author of the 1793 Patent Act. *Graham v. John Deere Co.*, 383 U.S. 1, 7, 15 L.Ed.2d 545, 86 S.Ct. 684 (1966). Jefferson, an inventor himself, had an aversion to all monopolies, including patents (which he considered a "public embarrassment" because they were monopolistic), but felt that an inventor should be allowed a right to the benefit of his invention for a specific period of time as a liberal encouragement to ingenuity. Jefferson did not regard the patent as a property right to the inventor; instead, he considered the invention an idea which once divulged became public property, with any exclusive right to profits merely in the nature of a reward from society:

> ". . . if nature has made any one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea, which an individual may exclusively possess as long as he keeps it to himself; but the moment it is divulged, it forces itself into the possession of everyone, and the receiver cannot dispossess himself of it. . . . Inventions then cannot, in nature, be a subject of property. Society may give an exclusive right to the profits arising from them, as an encouragement to men to pursue ideas which may produce utility, but this may or may not be done, according to the will

> and convenience of the society, without claim or complaint from anybody." (VI Writings of Thomas Jefferson, Washington Ed., at 180-181, as quoted in *Graham*, 8-9, note)

However, Jefferson did not believe in the "reward" or inducement of a patent for small details, obvious improvements, or frivolous devices; he struggled with the difficulty in "drawing a line between the things which are worth the public embarrassment of an exclusive patent and those which are not." (*Graham*, 383 U.S. at 9)

Jefferson attempted to develop a series of rules, which he related to acquaintances in correspondence, including such maxims as the following:

> "A change of materials should not give title to a patent. As the making of a ploughshare of cast rather than wrought iron;". . . .
>
> "A mere change of form should give no right to a patent, as . . . a square bucket instead of a round one." . . .
>
> "A man has a right to use a saw, an ax, a plane, separately; may he not combine their uses on the same piece of wood?"
>
> "A machine of which we are possessed might be applied by every man to any use of which it is susceptible." (*Graham*, 383 U.S. at 10, note)

However, Jefferson apparently never developed this series of maxims into a formal set of rules of patentability, and instead indicated to friends that since the commissioners' board was occupying more time than could be spared, he felt the matter should be turned over to the judiciary to be matured into a system. The only test of patentability remained the novelty and utility tests which Congress passed in Jefferson's draft of the 1793 Patent Act. *Ibid.*

The U.S. Supreme Court, in *Hotchkiss v. Greenwood*, 11 How. 248 (1851), first went beyond the restraints of novelty and utility to declare invalid a patent that was presumably new and useful, but violated Jefferson's "change of materials" maxim (in this case, substitution of porcelain or clay for wood or metai in doorknobs). The Court held:

> "(U)nless more ingenuity and skill . . . were required . . . than were possessed by an ordinary mechanic acquainted with the business, there was an absence of that degree . . . which constitutes essential elements of every invention. In other words, the improvement is the work of the skillful mechanic, not that of the inventor." (*Hotchkiss*, 11 How. at 267)

This case gave birth to the concept of "invention" as more than mere usefulness and novelty, but including a functional element of degree of skill which the Court admitted was not definable with precision.

It is this concept that has evolved into the element of "obviousness."

A generation ago, the Court, in what was sometimes criticized as an unfortunate choice of words, described this concept in the following terms:

> "(T)he new device, however useful it may be, must reveal the flash of creative genius, not merely the skill of the calling." *Cuno Corp. v. Automatic Devices Corp.*, 314 U.S. 84 at 91, 86 L.Ed. 58, 62 S.Ct. 37 (1941)

Some commentators and lower courts felt that this implied the inventor must have an immediate moment of inventive realization at a specific point in time. The Court, in *Graham*, however, found that *Cuno* was not a

modification of the *Hotchkiss* test, and found that the "flash of creative genius" phrase was but a rhetorical embellishment, restating the requirement that the subject matter sought to be patented must be beyond the skill of the calling. It was the device, not the invention, that had to reveal the "flash of creative genius." (383 U.S. at 15-16, note)

Perhaps "a touch of genius" would have been a more appropriate phrase.

The Supreme Court made another attempt to clarify the concept in the *Great Atlantic and Pacific Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 95 L.Ed. 162, 71 S.Ct. 127 (1950). Here, the Court stressed "the presence or lack of invention: (a device with old factors) must make an addition to the sum of useful knowledge or a distinctive contribution to scientific knowledge." (340 U.S. at 147) The Court found that innovation and advancement was an inherent requisite in the constitutional concept of a patent; accordingly, the Court found such a standard written into the Constitution. (340 U.S. at 154, concurring opinion)

In this context, Congress passed the 1952 Patent Act, with the following provision for "obviousness" written into statute for the first time:

> "Sec. 103. *Conditions for Patentability; non-obvious subject matter.*
>
> "A patent may not be obtained though the invention is not identically disclosed or described as set forth in Sec. 102 of this Title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter

pertains. Patentability shall not be negatived by the manner in which the invention was made." (35 U.S.C. Sec. 103 (1952))

In the first Supreme Court interpretation of this clause in *Graham*, the Court found the final sentence to be an attempt to abolish any implications from the *Cuno* "flash of creative genius" phrase that a sudden inspiration, as opposed to long and careful step by step toil, was necessary for patentability. However, the Court in *Graham* disavowed any such time factor in the *Cuno* test, and stated instead that *Cuno* did not go beyond *Hotchkiss* in its concept of patentability. (383 U.S. at 15-16)

Graham, and its companion case, *U.S. v. Adams*, 383 U.S. 39, 15 L.Ed.2d 572, 86 S.Ct. 708 (1966), elaborated in great detail on the Court's interpretation of the concept of obviousness as expressed in Section 103 and prior judicial precedent.

Specifically, the Court found that "basic factual inquiry" must be made into the state of the art of the subject matter of the patent, to determine what was *in fact* "obvious" in the field of knowledge pertaining to the patent at the time of its invention. The Court set up three areas of emphasis in this investigation:

"(a) The scope and content of the prior art are to be determined;

"(b) The differences between the prior art and the claim at issue are to be ascertained; and

"(c) The level of ordinary skill in the pertinent art resolved."

"Against this background, the obviousness or non-obviousness of the subject matter is determined." (383 U.S. at 17)

The Court added somewhat casually, without amplification:

"Such secondary considerations as (a) commercial success, (b) long-felt but unresolved need, (c) failure of others, (d) et cetera, might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or non-obviousness, these inquiries may have relevancy. See note, Subtests of "Non-obviousness": a Non-technical Approach to Patent Validity, 112 U.Pa.L.Rev. 1169 (1964)." (383 U.S. at 17-18)

(It might be added in passing that the Law Review note cited was not organized into the specific three headings mentioned by the Court, and mentioned a number of other "sub-tests" as well, about which more will be said below.)

The companion case, *Adams*, added several other factors as well: previous inoperable or failing inventions; different operating characteristics of prior art; unexpected operating characteristics in comparison to prior art; known disadvantages of old devices of prior art; whether noted experts expressed disbelief in the invention or recognized the significance of the invention; and the amount of prior art in a preceding period in comparison with overall advancement of the field. (383 U.S. at 50-52)

The Court further recognized that there will be difficulties in applying the non-obviousness test to the statutory "subject matter as a whole," and "what is obvious is not a question upon which there is likely to be uniformity of thought in every given factual context." (383 U.S. at 18)

Since *Graham/Adams*, the Court has also added that:

> "A combination of elements may result in an effect greater than the sum of several effects taken separately." *Anderson's Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57 at 61, 24 L.Ed.2d 258, 90 S.Ct. 305 (1969)

Similarly, in the last few years, the Court has stated:

> "We cannot agree that the combination of these old elements to produce an abrupt release of water directly on the barn floor from storage tanks or pools can properly be characterized as synergistic, that is, result(ing) in an effect greater than the sum of the several effects taken separately." (Citing *Black Rock*) *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 47 L.Ed.2d 784, 96 S.Ct. 1532 (1976)

(See similar language to the effect that the combination of elements must contribute something new or different or exceed the sum of the parts. *Great Atlantic & Pacific Tea Co.*, 340 U.S. 147; *Lincoln Engineering Co. v. Stewart-Warner Corp.*, 303 U.S. 545, 82 L.Ed. 1008, 58 S.Ct. 662.)

Thus American patent law has progressed in a consistent strain a concept of patentability beyond the mere "novelty and utility" tests of Jefferson's draft of the 1793 Patent Act. We have come from a rudimentary feeling of Jefferson's that a mere change of material or form, even though novel and useful, should not be patentable. This additional factor we might call "substantive novelty"; that is, new not merely technically or in detail, but novel in concept and scope as well. It is perhaps unfortunate that Congress chose to label this characteristic "obviousness." It is perhaps more appropriately an extension of the degree of novelty; "the touch of genius" reflected in *Hotchkiss;* a startling or striking advancement or contribution to the field, as opposed to

something new but only a minor, technical, and modest advance of the state of the art. (Perhaps the "little novelty" or mere novelty might be analogized to the doctrine of equivalents; that is, that the person of reasonable skill in the field would have known of the interchangeability or similarity of function.)

Certainly this concept of substantial novelty, or novelty to a high degree, reflects that inventive genius which Jefferson wishes society to reward; likewise, mere change of form or material, even though new, is not that novelty of concept and significant advancement of the state of the art to which Jefferson wished to limit society's inducement.

The subjective element in this evaluation is the individual judge. That is, of course, not uncommon in legal development as the Court in *Graham* recognized, analogizing to the judicial development in such frames of judicial reference as negligence and scienter. (383 U.S. at 18) More severe critics have suggested that this results in "as many different standards of patentability as there are district judges. . . ." Richard L. Robbins, SUBTESTS OF "NON-OBVIOUSNESS": A TECHNICAL APPROACH TO PATENT VALIDITY, 112 U.Pa.L.Rev. 1169 (1964) (hereinafter cited as *Robbins*), citing *Gross v. JFD Mfg. Co.*, 207 F.Supp. 631, (E.D. N.Y. 1962).

But, this consistent theme in American patent law from Jefferson to this third century of our nation's existence is that the state of the art as a whole as it relates to the patent must be examined in some detail, including as *Graham/Adams* observed, not merely the prior patents or other narrowly technical "file wrapper" types of materials, but also the general level of mechanical and expert skill in the field, "secondary considerations" of commercial factors and research

problems in the industry, and additionally the opinions of experts and skilled practitioners toward the significance of the invention at the time of its entry into the marketplace.

The great bulk of evidence presented at the trial on these issues—perhaps as much as three-fourths of the trial testimony—it is respectfully submitted, was not considered by the Court in its Decision.

Again, however, the point to be made is that in a process or method patent, if there is one admittedly novel step added by the inventor, and this step is critical and efficacious, under the Jeffersonian standard it must by definition be non-obvious.

It is respectfully submitted that the rate of flow described by the Karch patent, and characterized by perhaps the leading expert in the country on watershed soil conservation at the time the Karch process was patented as "revolutionary and unorthodox," is precisely this sort of significantly new contribution envisaged by Jefferson. The difference between the Karch rate of flow as a step in the soil conservation process was distinct and significant. It was more than just "new", it was a step which significantly advanced the state of the art.

(Of course, the "secondary considerations" discussed below further dramatically reveal contemporary "state of the art" reactions to the innovations of the Karch process.)

II.

WHEN THE COURT OF CLAIMS FOUND THAT THE CRITICAL NEW ELEMENT OF GAUGING OR RESTRICTING RATE OF WATER DISCHARGE TO A SPECIFIED AND ADMITTEDLY EFFICACIOUS RATE OF FLOW WAS NOVEL UNDER 35 U.S.C., SEC. 102, THE COURT ERRED IN INTERPRETING THIS COURT'S FACTORS FOR EVALUATING VALIDITY UNDER 35 U.S.C., SEC. 103 (NON-OBVIOUSNESS), WHEN THIS STEP WAS PREVIOUSLY UNMENTIONED IN THE PRIOR ART.

The Court of Claims found as a matter of law, after extensive review of the expert testimony and documentary patent and non-patent examples of the prior art, that the Karch process was novel under 35 U.S.C., Sec. 102(a), and was not anticipated by the prior art. (Pamphlet Decision, p. 7a)

Karch himself, in his testimony on the witness stand, described in detail his creative process in operating a bulldozer to clear blocked ditches, installing culverts and finding them blocked and partially blocked, and finally coming to the conclusion that pre-existing drainage attempts were removing rainwater too quickly from the fields. (R. 892-911) He described, on the other hand, the problems of overly long retention of water on the land and its destruction of crops and destructive effect on the soil. With extremely time-consuming field experimentation, colorfully interrupted by marauding farm animals, he dramatically described his discovery of the "just right" size of openings for drainage, which were "smaller openings than any engineer had ever used before" to drain cultivatable farm fields. (R. 911)

> "The engineers were sneering at me and they were saying that it was impossible, the flow can never be reduced down that low, and I had to constantly face criticism and even going around to the farmers and suggesting that the flow be reduced down to such a

low flow, because there was not any precedent for it; there wasn't anything in the engineering books." (R. 911)

Through his concept of "restricted flow" as the critical step in the soil conservation process, he concluded that "I recognized the function of the water—that the soil could be stopped systematically. . . ." and erosion prevented but the fields still safely cultivated. (R. 916)

The Court of Claims, in its Opinion, observes that since the time of the ancient Egyptians silt has been observed to have a beneficial effect, and that it is therefore "obvious" that a person of ordinary skill in the farming arts would recognize the essential step of the Karch patented process. (Pamphlet Opinion, pp. 11-12)

It is respectfully submitted that this is a gross example of the error of hindsight in determining obviousness. The case law of obviousness is replete with the statement that in determining the validity of a patent, the prior art must be viewed from the vantage point of one having ordinary skill in the art at the time the invention was made, without reading into the art the teachings of applicant's invention. Hindsight is of no value in determining what would have been obvious. *Walt Disney Productions v. Niles Communication Center, Inc.*, 369 F.2d 230, 234; 151 U.S.P.Q. 528, 531 (7th Cir. 1966); *Shumaker v. Gem Mfg. Co.*, 311 F.2d 273, 276 (7th Cir. 1962); *Hazeltine Research Inc. v. Dage Electric Co., Inc.*, 271 F.2d 218, 225 (7th Cir. 1959)

It is respectfully submitted that, in a process or method patent, if a step in the process is novel, and if it is critical to obtaining the desired result, it is as a matter of law non-"obvious" under the concept of non-obviousness as it has existed in an unbroked progression from the time of Thomas Jefferson.

III.

THE CONCEPT OF *NOVELTY* AS AN ELEMENT OF *PATENTABILITY* UNDER SEC. 102, AND THE CONCEPT OF THE DEGREE OF SUBSTANTIVE NOVELTY AS "*DIFFERENCE* FROM PRIOR ART" AS AN ELEMENT OF *OBVIOUSNESS* UNDER SEC. 103 ARE INTERRELATED; SPECIFICALLY, IN A PROCESS PATENT FOR SOIL CONSERVATION, ADDING THE CRITICAL ADDITIONAL RESTRICTION OF A SPECIFIED AND ADMITTEDLY EFFICACIOUS *RATE OF FLOW* OF DISCHARGE WATER IS A SIGNIFICANTLY DIFFERENT STEP, NOT ONLY TO DISTINGUISH THE PATENT ON THE BASIS OF COURT-FOUND NOVELTY BUT ALSO TO MAKE THE PATENT NON-OBVIOUS IN VIEW OF A PRIOR ART TOTALLY SILENT ON THE SUBJECT OF CONTROL OF THE RATE OF FLOW.

The importance of rate of flow in the hydrology of soil conservation cannot be overemphasized. As plaintiff's expert, Dr. Ackermann, indicated in his testimony, in regard to field soil conservation concepts, "Size makes a tremendous difference." (R. 721)

The Court, in its Opinion, states that:

> "A *trade-off* between the desire of having the water stand in the basin for a long period of time in order to recover as much of the silt as possible on the one hand, and, on the other hand, the desire of removing the water from planted fields to avoid crop damage would *obviously be recognized* by a person of ordinary skill in the art." (Pamphlet Opinion, p. 12, emphasis supplied)

It is respectfully submitted that a "trade-off" between one fundamental approach to rainwater handling on farm fields and another diametrically opposed approach is in no way obvious, even in layman's terms. To a person of "ordinary skill" the two methods are diametrically opposed, and any combination of them would not be "obvious," but miraculous.

Prior to invention of the Karch process, there were only two basic concepts of farm field soil conservation through rainwater control: quick removal and impoundment.

1. *Quick Removal.* The most common concept was to move all of the normal rainwater off of the farm fields quickly and as safely as possible. On the fields themselves, this took the form of grass strips, combined with contour farming, broad terraces along the contour, grass waterways, strip cropping, and large tile drains, wide ditches, and similar processes to conduct the entire rainfall as quickly as possible from the farm fields while at the same time attempting to minimize the erosive force of the water. At the ends of fields, or in gulleys or ditches, steep grades were protected by a "weir notch" or "drop inlet," which was described as a "safe stairstep down for water"; at most these devices attempted to break the hydraulic force of the water while at the same time permitting it to flow as rapidly as possible. (R. 700, 706) Illustrations of this process are Defendant's Exhibit 17, Defendant's Exhibits 8, 9, and 10 (substantially the same); and Defendant's Exhibits 26 through 30, and 32 (Rollene Farm); Plaintiff's Exhibit 1, Col. 1, lines 70-72; Col. 2, lines 1-33.

This method of water control is the most obvious and commonly used, but has substantial disadvantages. It takes farm land out of cultivation by making extensive use of grass waterways or strip farming, and the concrete drop inlets or weir notches, frequently quite large, are difficult to cultivate around, and tend to wash out in flood conditions. Silting may or may not be a disadvantage, as in heavy rains silt tends to mound around eddies and backwater points, while more severe erosion occurs at points of rapid water movement.

2. *Impoundment and Wet Basins.* The other traditional concept is a permanent impoundment of the water, a "wet basin." Defendant's Exhibit 23, the Texarkana Pipe Company 1920 booklet, "Vitrified Clay Sewer Pipe and Drain Tile on the Farm." This is a typical wet basin storage which attempts to capture silt in an impoundment, and when the capacity of the impoundment is reached any further inflow is removed as quickly as possible through a culvert, spillway or overflow. Similar to this in concept are Defendant's Exhibits 11 and 25, using "spillway storage" in a wet basin. Here again there are severe disadvantages, the most notable one being the entire "wet basin" being taken out of cultivation until, over a period of years, it is totally silted in, at which time it is converted to a quick removal system through use of a weir notch, drop inlet, tile drain, or related method. Likewise, although the silt is captured, it tends to be in a flat, lake-bottomed topography, due to the relatively even sediment deposit from the stagnant water; after conversion to a quick removal system this level area quickly becomes eroded by the fast moving water.

3. *Lack of "Middle Way".* Traditionally, these two systems are seen as incompatible and inherently contradictory. To be sure, attempts at combination of the two systems have been made, such as elevating the tile drains slightly from terraced outlets to provide a slight area of ground absorption, in the hopes that water will not stand in this area so long as to destroy crops. See Plaintiff's Exhibits 9 & 10; Plaintiff's Exhibit 99B ("Spring 1963" sketch portion) shows the outlet of one impoundment 14 vertical feet from the lowest point, reflecting substantial permanent impoundment of water. (R. 658-660) However, these still have quick removal

"full flow" outlets once the elevation of the drain outlet is reached.

Attempts to combine the two concepts have been unsuccessful, achieving the disadvantages of both: wet spots and semi-permanently soggy low areas, along with irregular deposits of silt or mounding creating small wet spots behind the mounds as well, due to the irregular deposit of silt from the fast moving water; crops are damaged in any but relatively dry weather; and the structures are subject to frequently being washed out.

4. *Flood Control Impoundment.* Defendant's Exhibits dealing with the "Little Sioux" structures, Exhibits 4 (Group 5, 6, and 7; and Defendant's Exhibits 31 and 33—all group exhibits), and also the Miami Valley Watershed structures (Defendant's Exhibits 14, 15 and 16), are flood control structures designed to impound temporarily massive amounts of flood water in extreme rainfall situations, until the "quick removal" systems adequate for normal rainfall can handle the excess flood water. These flood control structures are typically on the large streams and rivers of the lower watershed; it is considered unnecessary to have such impoundments on the farm fields of the upper watershed where massive flooding does not occur. Any silt deposits within the structures are undesirable features as they impede the storage capacity of the reservoirs for flood control; however, some irregular mounded type of silt deposits will occur as the water abruptly backs up or flows quickly. Such temporary silt deposits are frequently flushed out by later rainfalls.

* * *

Thus, in the traditional soil conservation concepts prior to the Karch process, on farm fields there has been a two-fold approach: either to remove the rainwater as quickly as possible consistent with safe passage down large grass or piped waterways, or, on the other hand, permanent impoundment supplemented with a quick removal overflow system. Although some flood water systems have a concept of temporary storage, it is for extreme rainfall situations and not for ordinary, "normal" rains.

1. *A Quantum Leap in Conservation Concepts.* The Karch concept represents a totally different way of looking at the problem of control of rainwater on farm fields for soil conservation. The Karch process utilizes a large area of the entire farm field where the rain falls as a shallow temporary storage area with continuous slow drainage of normal rainfall.

As the Trial Court properly observed in Finding of Fact 19, the patent clearly specifies normal rainfall utilization of the process. Likewise, as the Court implies in Findings 6 and 15, and as the specifications of the patent make clear (PX 1, Col. 5, lines 8-18; Col. 5, lines 39-45; Col. 6, lines 4-8, and 21-28; Col. 6, lines 55-66; Col. 7, lines 32-59 and 62-71; Col. 8, lines 1-6, and 14-28, etc.), large farm fields are the primary area of emphasis.

It is this concept of storing the water on the farmland where it falls, and removing it as *slowly* as possible consistent with safety of farming, that is the critical distinction from the prior art, which primarily removed the water as *quickly* as possible from the farm fields, or permanently impounded it. Karch himself frequently referred to this essential concept as the "restricted flow" approach.

2. *Critical Elements of the Karch Process.* The Karch patent claim is reproduced (PX 81) on the opposite page.

To a person unfamiliar with the process, however, several of the elements are particularly striking:

(a) As indicated above, the primary utility of the process is in normal rainfall on farm fields on the upper watershed. Being retained at the spot where it falls, as closely as possible, the rainwater does not have the opportunity to gather substantial downhill speed and force. As the patent expresses this:

> "It should be emphasized that my invention is especially suitable in the application of erosion control fairly near the source of erosion, at the higher elevations of the terrain. While every worker in the art realizes the importance of applying the controls at this point, no one prior to my invention had developed a successful method for stopping erosion at its source. According to the principles of my method, the water is released from the dry basin at such a slow rate that it will not cause any substantial erosion below the barrier structure. This is one of many features which distinguish my methods and means of erosion control from the prior art." (PX 1, Col. 6, lines 55-66)

(b) Normal rainfall is stored where it falls as long as possible, and is released as slowly as possible, which under normal growing conditions is approximately one-half to two days. (PX 1, Col. 4, lines 3-14)

(c) This results in a very precise gauging of the discharge inlets or orifices, sometimes as closely as one inch in diameter for these orifices; it is this which appeared ridiculous to many of the experts in the field, and resulted in frequent difficulty in Karch obtaining early acceptance for his process. (R. 911; PX 83D)

"Plaintiff's Exhibit ~~for Identification~~ No. 81"

That which is claimed as new is:

The method of stopping erosion by slit-containing water flowing in a gully, and causing deposition of silt therefrom, comprising:

1. Erecting a water barrier across said gully to provide a temporary retaining basin for at least some of said water.

2. Said barrier comprising a conduit positioned substantially horizontally beneath and transversely of said barrier, the inlet of said conduit being at the lowest point in the basin; providing a spillway near one end of said barrier of lower elevation than the top of said barrier receiving silt-containing water in said basin;

3. Causing water to collect in said basin by discharging water from the floor of said basin solely through said conduit at a flow volume substantially less than that at which water enters said basin, and

4. Thereby causing deposition of silt from said water on the floor of said basin, in substantially successive increments at the ever-changing water periphery; and

5. Continuously discharging desilted water from said conduit until said basin is empty:

Whereby erosion in said gully is eliminated and said basin is thereafter operable as a safely cultivatable dry basin, wherein the basin floor slopes upwardly from the conduit level to the ultimate silt level.

(d) At these rates of discharge, an unexpected result occurs: the silting problem, so prominent in the traditional previous soil conservation methods, is not only solved as a problem, but becomes one of the major beneficial effects of the process. This "magic rate" of one-half to two days discharge for normal rainfall on farm-size fields has the effect on suspended silt comparable to a sluggish but still running bathtub, depositing "rings" in concentric circles as the water drains out. In terms of the claim of the patent,

> ". . . thereby causing deposition of silt from said water on the floor of said basin in substantially successive increments at the ever-changing water periphery; . . . wherein the basin floor slopes upwardly from the conduit level to the ultimate silt level." (PX 1, Col. 8, lines 50-59)

As Karch's testimony dramatically describes his observation and realization of this phenomenon (R. 896-916, PX 115 through 118), the silt is left in a self-draining sloping position, leaving neither the irregular mounding and eddy pools caused by rapid moving water from the "quick removal" conservation methods, nor leaving stagnant and flat-bottomed non-draining wet spots caused by the impoundment or crop-destroying "too slow" effect.

(e) Familiarly, Karch referred to this critical rate factor as "restricted flow" because of the use of such extremely small openings in comparison to the prior "quick-removal" concepts. Karch also referred to this as "controlled flow," or "putting the rainfall under control" on the land. (R. 909)

The degree in reduction of size of culverts and waterways is a very striking and dramatic feature of the Karch process in the field. As the patent points out, Col. 7, lines 3-31, under standard engineering determinations, a 640-acre area of midwest farmland would

require a culvert approximately 9½ feet in diameter to handle normal runoff. In sharp contrast, the Karch process would utilize a discharge conduit for the same field of less than 12 inches. This dramatic difference brought Karch ridicule and skepticism in his early attempts to obtain acceptance of his concepts. (R. 911)

* * *

The conclusion is inescapable from these salient features that the Karch process represents a dramatic departure from traditional approaches to farm soil conservation. We now turn to the reaction of those experienced with the state of the art to the Karch process immediately after its development.

Patent lawyers, and judges experienced in patent matters, tend to think of patents in terms of machines or devices, as the overwhelming majority of patents are of this type. It is easy to overlook the distinction, and to begin thinking of a process or method patent in terms of machine or device requirements; the Trial Judge, in Findings of Fact Nos. 17 and 35, appears to fall into this error.

As the Supreme Court has repeatedly pointed out, in considering the invention as a whole, a process patent can be distinguished from the physical device by which it is carried out:

> "A machine is a thing. A process is an act, or a mode of acting. The one is visible to the eye, an object of perceptual observation. The other is a conception of the mind, seen only by its effects when being executed or performed." *Tilghman v. Proctor*, 12 Otto 707, 728; *cf. Burr v. Duryee*, 68 U.S. 531, 570, 17 L.Ed 650.

In process or method patents the *manner* of doing is the "invention." (*Bauer Bros. Co. v. Bogalusa Paper Co.*,

96 F.2d 991, (5th Cir. 1938); reh.den. 97 F.2d 732) An inventor, to secure a patent for a new and useful method, need not discover a new principle of mechanics, since it is usually the application of old principles to a new method that involves the patentable subject matter. *Application of Watter*, 147 F.2d 685, 32 C.C.P.A., Patents 895 (1945). A process patent is subject to the same tests of patentability as any other patent, given the above distinctions. *Proler Steel Corp. v. Luria Bros. & Co.*, 417 F.2d 272 (9th Cir. 1969).

Two processes are not identical where the successive steps are different, nor when several steps necessary to one are completely left out of the other. *U.S. Glass Co. v. Atlas Glass Co.*, (Pa. 1898) 90 F. 724, 33 C.C.A. 254. In determining the validity of a patent, the test of identity or equivalents of two processes is not the apparatus or materials used but whether they involve identical or equivalent steps. In determining the validity of a patent, steps in two processes are equivalent if they work in substantially the same way *to accomplish the same results. Kemart Corp. v. Printing Arts Research Laboratories, Inc.* (C.A.Cal. 1953) 201 F. 2d 624.

In determining the validity of a process or method patent, the test of identity of processes is not the apparatus used for carrying them out, but whether they involve identical or equivalent steps. *Celite Corporation v. Dicalite Co.* (C.C.A. Cal. 1938) 96 F.2d 242, *cert.den.* 59 S.Ct. 101, 305 U.S. 633, 83 L.Ed. 407. Process or method patents can only be anticipated by a similar process or method, and not by a prior device or piece of mechanism by which the process or method might have been formed, or that might be made effective in carrying out the process, or by earlier devices which require alteration to carry out such processes. *Schumacher v. Buttonlath Mfg.*

Co., (C.C.A. Cal. 1920) 292 F. 522. See also *Carnegie Steel Co. v. Cambria Iron Co.* (1902 22 S.Ct. 698, 704, 185 U.S. 403, 46 L.Ed. 968; *W. D. Haden Co. v. Mathieson Alkali Works*, (C.A.Ala. 1941), 122 F.2d 650, *cert.den.* 62 S.Ct. 634, 315 U.S. 805 86 L.Ed 1205; *Hartford-Empire Co. v. Coe* (1936) 87 F.2d 741, 66 App.D.C. 344.

The fact that steps in a process are old does not negate invention; in considering the patentability of a process consisting of a plurality of steps, the question as to whether individual steps are old is immaterial to the question of whether the combination constitutes a statutory "process". *Application of Musgrave*, 431 F.2d 882, 57 C.C.P.A. 1352 (1970); *Nixon v. Marzall*, 186 F.2d 352 (11th Cir. 1950); 87 U.S.App.D.C. 415 (1950).

When the result comes from certain acts or from a series of steps, irrespective of mechanism, then the acts performed or the mode of treatment involve the patentable invention. *Buffalo Forge Co. v. City of Buffalo*, 246 F. 135 (D.C.N.Y. 1917) A patentable invention can lie in the recognition of a problem and the promulgation of a solution, as well as in the actual construction of an embodiment of that solution. *Systematic Tool & Mach. Co. v. Walter Kidde & Co., Inc.*, 390 F.Supp. 178 (D.C. Pa. 1975)

Accordingly, superficial similarities in appearance should be regarded with great suspicion when testing a process or method patent, and it must constantly be kept in mind that the appearance of the mechanism is not necessarily related to the purpose or result achieved by the step in the process. And conversely, infringement of a method patent is not dependent on the form of apparatus used. *Cochrane v. Deenier*, 94 U.S. 780, 787-788, 24 L.Ed. 139 (1876); *Binks Mfg. Co. v. Ransburg Electrocoating Corp.*, 281 F.2d 252, 258 (7th Cir. 1960);

Sbicca Dell Mac, Inc. v. Milius Shoe Co., 145 F.2d 389, 397 (8th Cir. 1944). In other words, an apparatus or device appearing precisely alike may serve a totally different function in a particular process or method patent than it served in another patent, particularly if the second patent is of a device or machine.

In the Karch patent, a key element of the process separating the invention from prior art, and the element which makes it most distinctive, is the element of rate of flow of the normal rainwater from the farm fields. This is clearly defined as one-half to two days under the cultivation conditions for which the process is specified, and it is further identified descriptively by its results, that is,

> ". . . causing deposition from said water on the floor of said basin, in substantially successive increments at the everchanging water periphery; . . . wherein the basin floor slopes upwardly from the conduit level to the ultimate silt level." (PX 1, Col. 8, lines 50-58)

Certainly, it is not uncommon for rate of flow or time to be an essential element in a patent. See, for example, *Continental Can Co. v. Crown Cork & Seal, Inc.*, 281 F.Supp. 474 (E.D.Pa. 1967); *Fischer & Porter Co. v. Hasket*, 354 F.Supp. 464 (E.D.Pa. 1973); *James Bury Corp. v. U.S.*, 518 F.2d 1384 (C.Cl., 1975); *McCullough Tool Co. v. Well Surveys, Inc.*, 343 F.2d 381 (10th C.C.A., 1965); etc.

As the United States Supreme Court phrased it in a slightly different context:

> "Here, however, the Adams battery is shown to embrace elements having an interdependent functional relationship . . . If such a combination is novel, the issue is whether bringing them together as taught by Adams was obvious in the light of the prior art." (*U.S. v. Adams*, 383 U.S. at 50)

And a District Court phrased the relationship of time and use as follows:

> ". . . . The patents in suit contain extensive and detailed disclosure of the *time*, temperatures, and pressures for carrying out the . . . molding and curing methods. The condition of the (product) after the completion of each process is clearly specified both as to physical form and properties necessary for intended use." (*Continental Can Co.* 281 F.Supp. at 476) (emphasis supplied)

The *Continental Can* case is very analogous to Karch, in that the time element is a critical step in the process in both cases, and the results are depicted descriptively in terms of the end process as assistance for judging time and rate matters.

As the *Graham/Adams* companion cases point out, the United States Supreme Court has made it an integral part of non-obviousness that among the relevant factors are that operating results were unexpected, and that known disadvantages in old devices would naturally discourage the search for new. (*U.S. v. Adams*, 383 U.S. 39, 52; *International Tel. & Tel. Corp. v. Raychem Corp.*, 538 F.2d 453; *Stevens v. Comm. of Int. Rev.*, 452 F.2d 735 (10th C.C.A. 1972); *Bowser, Inc. v. U.S.*, 388 F.2d 346, 156 U.S.P.Q. 406 (1967); *Martin-Marietta v. U.S.*, 343 F.2d 972, 153 U.S.P.Q. 206 (1967).) Both of these factors were present in the Karch case. Mr. Karch testified repeatedly regarding his experience on the bulldozer watching his field impoundments, and his surprise to see how well they held up; likewise, the handling of silt by the impoundments was much more effective than Mr. Karch had any reason to expect prior to his actual tests.

* * *

Accordingly, the Karch patent, with its distinctive element of the rate of flow of discharge, is a sharp departure from the prior art, and introduces a whole new concept to the field of farm soil conservation. Particularly in consideration of the unexpected operating characteristics of utilization of silt, and the dramatic disadvantages of wet soil and silting problems which the Karch method overcomes, the Karch process is clearly not obvious in the light of the entire state of the prior art.

As was discussed above under the heading of Jefferson and the development of the concept of obviousness, the concern with "obviousness" is a development of a concern for a higher degree of novelty than the statutory "novel and useful." This requires a look at the state of the art to determine what was the degree of departure from the existing prior art with the Karch invention.

The *Graham* case focuses on three different elements (in addition to the "secondary considerations" which will be discussed below): the scope and content of the prior art; the differences between the prior art and the Karch patent; and the level of ordinary skill in the pertinent art.

Here, as set forth above, the scope of the prior art was totally different. Concepts in the prior art for soil conservation on upper watershed farm fields prior to Karch consisted of the quickest possible removal of the rainwater, or the permanent impoundment, as shown by the extensive exhibits and testimony of the defendant's own experts. Only in the case of flood waters was there any concept of temporary impoundment, and in those examples previously cited by the defendant the only *purpose* shown was that of preventing flooding, not soil conservation. This purpose was particularly revealed by the

fact that in *normal* rainfall there was no restriction of flow of rainwater at all, and only in extremely heavy or exceptional rain circumstances were any of the structures temporarily impounded. Likewise, in the case of retention of silt, the capture of silt was disadvantageous to the purpose of the structure, was undesirable, and was irregular due to the fast condition of the water flowing through the structure, which frequently flushed out any silt which was retained from earlier rains.

Likewise, the differences between the prior art and the patent claim are numerous and substantial, as reflected in the testimony of the plaintiff's expert, Virgil Dodson, which is in turn PX 130, Claim Chart Reading on Alleged Prior Art and Infringing Method. Again, in virtually every case of prior art, there was no concept of restricted flow as an essential element of the process, although in some cases there was incidental temporary impoundment not related to any soil conservation purpose, and with no intentional recapture of silt.

Finally, the level of ordinary skill in the pertinent art is not only reflected above, but is also reflected in the following material describing reactions of contemporary specialists in the field of farm soil conservation.

The unanimous Supreme Court in *Adams*, the companion case to *Graham*, found a separate set of characteristics which must be considered in determining non-obviousness. The different operating characteristics, the unexpected nature of the operating characteristics, and the known disadvantages of old devices have been discussed above. As to the question of the reaction of others in the field, the Court in *Adams* stated as follows:

> "Nor are these the only factors bearing on the question of obviousness. We have seen that at the time

> Adams perfected his invention noted experts expressed disbelief in it. Several of the same experts subsequently recognized the significance of the Adams invention, some even patenting improvements on the same system." (383 U.S. 39 at 52)

Robbins points out that two sets of reactions of experts are possible to a valid patent: One, the approval of highly skilled experts, particularly independent writers such as text writers, university professors, scientific commentators, technologists and writers of trade publications; the other is to disbelieve or ridicule the possibility of success. (*Robbins*, 112 U.Pa.L.Rev., at 881-882) Other writers have pointed out the "tribute of its imitation" which enhanced the presumption of the validity of the plaintiff's patent. See *Diamond Rubber Co. v. Consolidated Rubber Tire Co.*, 220 U.S. 428 at 433 (1911) and *Charles Peckat Mfg. Co. v. Jacobs*, 178 F.2d 794, 801 (7th Cir. 1949, cert.den. 339 U.S. 915 (1950); *Ric-Wil Co. v. E. B. Keiser Co.*, 179 F.2d 401, 404 (7th Cir. 1950). Similarly, the Second Circuit, some time ago, remarked:

> "The imitation of a thing patented by a defendant, who denies invention, has often been regarded . . . as conclusive evidence of what the defendant thinks of the patent, and persuasive of what the rest of the world ought to think." *Kurtz v. Belle Hat Lining Co.*, 280 F. 277, 281 (2d Cir. 1922)

Of course, it is the nearly unanimous opinion that hindsight observations ". . . are of no value in determining the validity of the (subject) patent." *Walt Disney Productions v. Fred A. Niles Comm. Ctr., Inc.*, 369 F.2d 230, 234 (7th Cir. 1966), *Wyott Mfg. Co. v. Doran Coffee Roasting Co.*, 160 F.2d 644 (D.C. Colo. 1958) mod. on other grounds, 267 F.2d 200 (10th Cir. 1959)

Here again, the parallel of these cases, and particularly the *Adams* case, with the Karch case is remarkable. The government experts, by their own admission, refused to admit or recognize anything favorable in the plaintiff's process, then later when faced with its success, they imitated it, as we shall set forth hereafter.

The parallels between the *Adams* case and the Karch case are quite striking. Expert testimony at the Karch trial was overwhelming in support of the striking contributions of the Karch process. Perhaps the leading expert in the nation on the subject of farm field soil conservation at the time Karch developed his concepts was Dr. William C. Ackermann, former presidential advisor on the subject of water resources as a member of the White House staff (R. 695) and former director of the research division of the Soil Conservation Service (SCS) and Agricultural Research Service (R. 694) Dr. Ackermann, whose qualifications are further set forth in PX 102, testified as follows:

> "Q. . . . I think you characterized this (Karch) concept . . . as revolutionary and unorthodox? Is that an accurate quote of your statement to me?
> "A. Yes." (R. 700)

Dr. Ackermann further testified that he was personally responsible for the supervision of all government research in the area covered by the Karch patent at the time Karch was developing his method, and further it was Dr. Ackermann's legal responsibility to be aware of any private research in the same area.

Dr. Ackermann testified as follows:

> "Q. Did you know of any public or private research being conducted or that had been conducted at the time you left this position in 1956, comparable to or utilizing the steps of—that is, all of the steps of the Karch method.

"A. I felt it was, the Karch method as I subsequently learned about it, it was distinctly different." (R. 702-703)

In addition, plaintiff's expert, Virgil Dodson, testified as to the novelty of the Karch process (R. 66, *et seq.*), and Richard Harza, vice president of Harza Engineering, a major world-wide engineering firm employing some 600 persons, praised Karch's "fresh and creative thinking" in the field of soil conservation, and added that "he has challenged that which is orthodox" (PX 7, p. 6); Harza had written Karch in the late 1950s encouraging Karch to promote his views before engineering societies. (PX 101) After SCS employee Jacobson retired from the SCS without having constructed or considered any soil conservation process involving restricted flow, he went to work for Harza and discussed his ideas, and "Richard Harza asked me how our plan differed from the Karch plan." (R. 573) Thereafter, Jacobson came forward with a program depicting restricted flow, which was later announced as the SCS infringing method. (PX 98)

Likewise, there were a large number of favorable academic engineering articles supporting the Karch process, including PX 3, Virgil Dodson, *Report on Erosion and Floods;* PX 5, Virgil Dodson, *Controlled Flow on the Changing Watershed* (a paper presented at the National Symposium on Watersheds in Transition by the American Water Resources Association and Colorado State University); PX 6, *HILE* (The Karch Process) *Deserves an Honest Appraisal,* The Consulting Engineer, Nov. 1964; PX 4 Lawrence Samstead, P.E., *Hydrointransitive Land Engineering* (a paper presented to the American Society of Agricultural Engineers, New Orleans, La., 1964). Of course, the extensive Cavender review, *"Terraces Aren't Worth a Dam,"*

The Farm Quarterly, Summer, 1964, PX 7, has been continually referred to.

Likewise, in evidence is a very lengthy series of enthusiastically supporting statements from prominent agricultural users, including the farm manager of the Peoples Bank of Bloomington, responsible for around 130 farms of over 30,000 acres, who advocated the Karch process for trust properties in court in preference to SCS practices which, with subsidies cost only around one-half as much as the preferable Karch structures (R. 799-801, 803-805); and the vice president of the Farmers State Bank and farm manager as well as farm owner, who advocated Karch process structures for his own farm and the farms of other bank officers and friends. (R. 865-867) Similarly, a wholesale seed grower with 150 distributors operating 2400 acres of seed corn farmland refused SCS practices and instead installed Karch structures, which he has been very satisfied with and is continuing to install. (R. 772-781) Prominent area farmers also testified as to the success of their structures and the failures of SCS structures. (R. 931-936; 749-767) And *The Farm Quarterly* editor, Norman Cavender, stated that he personally interviewed virtually every farm owner and farm operator, worker or manager of the farms on which Karch structures were built, and personally examined around 90 percent of the Karch structures of which he was aware, and concluded that the response of the farmers to the effectiveness of the Karch process:

". . . was 100 percent. I had not one single person tell me he did not think it was doing the job that he expected of it, which was to—substantially as the (patent) claim lists here, that they were all well pleased with them . . . They are knowledgeable farmers. They have, some of them, some of the best (farms) in the area." (R. 379)

He concluded,

> "The list of farmers who had either left or ignored SCS (to go to the Karch method) reads like a minor register of Who's Who in Central Illinois Agriculture." (PX 7, p. 8)

Cavender concludes that reader response by the quality farm clientele of the journal was more than on any other article in the six years Cavender had been with the magazine and drew as much or more mail than had ever been drawn in the 20-year history of the journal. (R. 490)

* * * * *

Accordingly, the Karch patented process added the critical and important additional step of removing rainwater from farm fields at a *rate* which, because it was at precisely the proper timing, synthesized two previous methods which had hitherto been thought to be irreconcilable: the quick removal of rainwater off farm fields to protect crops, and the retention of water to compel deposit of silt. The substantive novelty, the dramatic innovation, of this process was recognized by responsible practitioners of the state of the art at the time of the invention.

The critical step of rate of removal, which was the major novel element of the Karch patented "restricted flow" process, was not only novel, as the Court found, but was also a substantial and major contribution to the state of the art, in view of the fact that the prior art was totally silent on the subject of control of the rate of the discharge flow.

IV.

"SECONDARY CONSIDERATIONS" ADMITTED BY THE COURT TO BE FOUND BY THE EVIDENCE ARE FURTHER PROOF OF THE NON-OBVIOUSNESS OF THE KARCH PATENTED PROCESS, PARTICULARLY IN THE LIGHT OF THEIR DRAMATIC SHOWING OF GOVERNMENT MISCONDUCT IN ATTEMPTS TO SUPPRESS AND BELITTLE THE PLAINTIFF'S INVENTION, BY GOVERNMENT OFFICIAL'S ACTIONS UNSUCCESSFULLY TO UNDERMINE THE PATENT'S COMMERCIAL SUCCESS, AND, WHEN ALL OF THESE MEASURES FAILED, THE ATTEMPTS BY U.S. GOVERNMENT EMPLOYEES TO CLAIM THE INVENTION TO BE THEIR OWN CONTRIBUTION TO THE ADVANCE OF THE ART.

As indicated above, the test of what is called "obviousness" is in the last analysis a test of what was in fact the *state of the art* at the time of the invention. The *Graham* case refers to three steps in determining this, with the critical element the "differences between the prior art and the claims at issue. . . ." (*Graham v. John Deere*, 383 U.S. at 17) *Graham* adds that commercial success, longfelt and unresolved needs, failure of others, et cetera, are "secondary considerations" (383 U.S. at 17), citing Robbins, Sub-Tests of "Non-Obviousness": A Non-Technical Approach to Patent Validity," 112 U. Pa.L.Rev. 1169 (1964).

As the Robbins article points out, the question is perhaps not phrased as primary versus secondary considerations, but a total examination of the state of the art. In such a context, frequently the reactions of experts in the field, both positive and negative, as well as commercial reactions, are relevant.

The reactions of experts, particularly the defendant, U.S. Government experts who were infringing on the plaintiff's patent, was dramatically brought out in the

case of *U.S. v. Adams*, 383 U.S. 39, 15 L.Ed.2d 572, 86 S.Ct. 708 (1966).

The parallels between the Karch facts and the facts as reported by the U.S. Supreme Court in *U.S. v. Adams* are striking. In the *Adams* case, the inventor in 1941 brought his discovery to the attention of the Army and Navy, who after observing demonstrations, did not believe the invention was workable. However, in November 1943, the Signal Corps concluded the battery was feasible and developed it, concluding by 1956 that the invention idea "has brought about developments which would otherwise have been technically or economically impracticable." The Supreme Court concluded:

> "Surprisingly, the Government did not notify Adams of its changed views or of the use to which it was putting his device, despite his repeated request. In 1955, upon examination of a battery produced for the Government . . . he first learned of the Government's action. His request for compensation was denied in 1960, resulting in this suit." (383 U.S. at 44.)

The reaction of U.S. Government soil conservation experts in the case of the Karch patent was very similar to *Adams*, and perhaps even more dramatic. Immediately after filing for his patent, in 1952, Karch visited SCS offices in Illinois, and went to Washington to speak with the Federal Administrator of the Soil Conservation Service, concluding in a visist from SCS staff to Karch installations. (R. 937-940, PX 40 and PX 41) However, despite initial favorable responses, the SCS began a consistent pattern of ridicule, scoffing, and even reflections on Karch's personal character and hostility towards him. These included such depiction as Karch being "insane and disagreeable . . . should be in a

straightjacket," (R. 944); the Karch work was "not any good" despite not having seen it (R. 945); taking Karch into custody when he attempted to pass out literature regarding his process at an SCS tour (R. 946-948); showing "sensitivity and perhaps hostility" (R. 708); and "strong feelings" (R. 500); the Karch process "didn't really work. . . . (The SCS was) opposed to the entire design of it" (R. 414-415); SCS advice not "to bring this controversy out because it would just stir up the situation even more" (R. 415-416); mention of Karch in an SCS office got "an immediate reaction which I would describe as consternation or immediate reluctance to discuss anything with me" (R. 402); an SCS officer, on hearing mention of the Karch method, commented "I am not even going to give you my name . . . I'm not going to make it easy on you. I haven't seen that (Karch) work except from a distance. It doesn't look like it would work, and I'm not going to get involved in it." (R. 385); the SCS research office "would not have conducted research on a method which was patented. . . .the benefits accruing from such research should benefit all the people and not just the patent holder" (R. 714-715); an SCS official "off the record" stated "people are reluctant to talk about this matter . . . we, ourselves, could work up specifications and standards on the Karch work, but I don't want to get involved in this" (R. 404); and the leading SCS expert commented on the Karch process: "Because the article was so adverse to the ideas that I have always had, I absolutely ignored the article." (R. 652) In addition, SCS officials refused subsidies on the Karch process (R. 941-943); questioned "how intelligent people . . . would be interested in any work of Mr. Karch" (R. 869-878); commented that Karch structures "do more harm than good" (R. 880); stated that the Karch "practice is not needed . . . grass

waterway (can be) developed" (PX 110, R. 804); after leading farm seed grower installed a Karch structure "the SCS questioned my sanity in using it," (R. 786); prior to the publication of *The Farm Quarterly* article, the SCS Washington office telephoned the editor and urged him not to do anything more on the article (R. 409), and after its publication, criticized *The Farm Quarterly* for "willingness . . . to espouse an unscientific and outmoded concept" (PX 49; R. 425), and thereafter fictionally appended the names of prominent agricultural professors to a "totally worthless" purported academic criticism of the Karch process (PX 62 and 63, R. 536-538, R. 295-299, R. 932, R. 789-790, R. 431-434). All of the above testimony was unrebutted; in addition the SCS officials attempted to persuade leading farm equipment manufacturers to stop advertising in *The Farm Quarterly* because of the Karch article. (R. 444-449, PX 73-74, R. 495-531, PX 96 and PX 97)

This pattern of ridicule and repudiation, coupled with personal attacks on Mr. Karch, was the pattern of SCS experts' reaction from the time of the filing of the Karch patent in 1952 until the year after *The Farm Quarterly* article appeared in early 1964.

Beginning in 1966, however, SCS documents first appeared in public print espousing the Karch "restricted flow" concept and, as plaintiff's expert Dodson, testified, reading on the claim of the Karch patent; (PX 15, R. 109-136, R. 1339, PX 130) this "Ill-33" document was a basic model for numerous other government specifications for the infringing process. (*e.g.*, PX 16 (offered); PX 38, PX 39, etc.) Documents included as a part of the Ill-33 specifications reflected dates in mid-1965, indicating that government scientists had been doing extensive field research during the 1965 growing season. (PX 15, Sec. VII, Appendix and attachments, unpaged)

After 1965, the government experts were as effusive in their praise at their discovery of the Karch concept of restrictive flow as they had been effusive in their ridicule of the Karch process and its supporters prior to 1965. An entire series of SCS-sponsored articles and documents appeared, glorifying the "new" discovery of restrictive flow structures in farm field soil conservation. (PX 15, PX 16 (offered), PX 17 (offered), PX 38; PX 39; PX 48; PX 52; PX 53; PX 54; PX 55; PX 61; PX 66; etc.) Defendant's answers to plaintiff's interrogatories (PX 82A) indicate that the "Ill-33" (PX 15) was prepared by the SCS staff and in effect as SCS specifications for the practice, concluding:

> "It is felt that the standards for the three states, Illinois, (PX 15), Iowa (PX 38) and Minnesota (PX 39) are typical of those for the remainder of the states using outlets." (PX 82A, Interrogatory 46)

The "Ill-33" (PX 15) document contained elaborate and detailed instructions and specifications for practicing the Karch patented process in connection with the standard SCS practices of terracing, as had been specified in the Karch patent (PX 1, Col. 7, lines 32-59). The document "Ill-33", as all SCS publications, takes pains to avoid any apparent identification with the Karch patented process, even including rather elaborate circumlocution and uncertainty regarding the name of the process:

> ". . . the name "level ridge tile outlet terraces" has been adopted. "Storage type terraces" is also acceptable. These are *descriptive* names only and are not to be confused with official reporting names. They will generally be reported as "Parallel Terraces." (PX 15, Sec. 1, p. 1, emphasis in original)

Other SCS writers and publications gave various titles to the practice, still claiming the process as a new idea developed by a since-retired SCS expert, the same Paul Jacobson who had so vehemently ridiculed the Karch patent. ". . . (T)he recently developed underground outlet commonly known as the tile outlet" (PX 16, p. 2); "parallel tile outlet terraces were pioneered by Jacobson . . ." (PX 17, p. 1); ". . . I (Jacobson) began a new type program of bench terracing on my farm in the spring of 1964" (PX 52, p. 8); "another innovation is the introduction of tile outlet terraces. . . ." (PX 53, p. 1); "the present concept of tile outlet terraces was developed by Paul Jacobson. . . . It involves a storage type graded terrace with an underground outlet to remove water in 12 to 48 hours. This permits a much smaller outlet than one necessary to take peak flow. . . . The first system to be built with SCS assistance using the present concept was November, 1963. . . ." (PX 54, p. 3); "The first Iowa system was installed . . . in 1963 . . . The idea has spread rapidly . . . Observations indicate that this new concept of level-ridge tile outlet terraces involves considerable training and field practice. These first installations have served to train technical field personnel. . .;" (PX 55, pp. 1-2) "Paul Jacobson . . . first applied the tile outlet principle. He designed the terrace basin for temporary water storage . . . selected to meter off the excess water which did not soak into the soil in 24 hours. . . ." (PX 66, p. 73) References to the year 1963 as Jacobson's innovation was testified to as incorrect by Jacobson himself, who stated on the witness stand that the terraces installed on his farm in 1963 were not those of his "final plan" but the inlets were 14 feet above the low point of the basins in 1963, and four feet above the low point of the basins in 1965. (R. 591-592, PX 99B)

In the "Ill-33" document, despite the circumlocution, the recent SCS conversion to the Karch principle of restrictive flow is apparent.

> "The innovation proposed here is the use of the storage principle for design . . ." (Sec. 1, p. 1)
>
> "During the past year the service has installed a number of terrace systems which incorporate the principle of retarded flow. The outlet for these terraces was through tile. The terraces were designed to store two inches of storm runoff. These have worked very well. (Sec. III, p. 1)
>
> "Tile outlets are mechanical spillways when used to dispose of excess water from a terrace system . . . The outlet conduit will be designed to remove the volume of storage provided for each terrace in a specified interval of time. The maximum time to de-water the terrace shall not exceed 48 hours. It is recommended that de-watering time of 24 hours be used when this is practical." (Sec. IV, p. 1)
>
> "It is important to restrict the flow of water into tile systems . . . If the inflow should need to be restricted further (and in most cases it will be) a metal plate with the proper size hole will be placed in the riser." (Sec. IV, p. 3)

It is instructive that the table of "discharge rates of circular orifices" (Sec. IV, Table 1) begins with a minimum of one inch and goes to a maximum of six inches, reflecting a program of extremely small discharge conduits, and accordingly further indicating the total commitment of the document to the concept of restricted flow.

The "Ill-33" document, particularly Sec. IV, consists of an elaborate system of computations, charts and tables, by which the Karch process can be duplicated, as testified to by plaintiff's expert, Dodson. (R. 109-136, R. 1339, PX 130) The document bears on its face the

signature of L. H. Binnie, from whose office it was issued as Illinois State Conservationist for the SCS. It is reminiscent of his earlier statement as testified by *The Farm Quarterly* editor, Norman Cavender; on that occasion, Mr. Binnie stated:

> "We, ourselves, could work up the specifications and standards on the Karch work, but I don't want to get involved in this." (R. 404)

In fact, the SCS even extended this quantification to create a computer program for the process (PX 17, offered) which concluded as its critical element "Recommended design is to store the runoff from a 10-year return period storm of 24 hour duration," and including in the illustrative computer program the critical conclusions "orifice diameter in inches" (typical programs were 2.1 to 2.5 inch range), and "time/hours" to de-water (with typical de-watering in the 21 to 23 hour time period). The document added incidentally:

> "Parallel tile outlet terraces were pioneered by Jacobson in Iowa, Livingston in Illinois, and Phillips in Iowa and Minnesota. Their efforts have brought about a reversal in the downward trend of terracing as Livingston reported 550 tile outlet terrace systems installed in the midwest during 1966. About double this number were built in 1967 and 1968 appears to show an even greater increase." (PX 17, p. 1)

These tabular quantifications and computer programs of the Karch process should not detract from the graphic description by field effects which Karch has given in the patent itself, as well as in his testimony. It is a familiar maxim of method patents that infringement of a process patent is not dependent on the form of the apparatus used, but only upon following the steps of the process. (*Cochrane v. Deenier*, 94 U.S. 780, 787-788,

24 L.Ed. 139 (1876); *Binks Mfg. Co. v. Ransburg Electro-Coating Corp.*, 281 F.2d 252, 258 (7th Cir. 1960); *Sbicca Dell Mac Inc. v. Milius Shoe Co.*, 145 F.2d 389, 397 (8th Cir. 1944).

* * *

The graphic and dramatic evidence, virtually all of it unrebutted at the trial, is that expert and farm practitioner reaction to the Karch process outside of the SCS prior to 1965 was overwhelmingly favorable to the Karch method; and that, although the SCS prior to 1965 overwhelmingly ridiculed and scoffed at the Karch method, after the appearance of *The Farm Quarterly* article in 1964, the SCS rapidly developed a process involving restricted flow with full knowledge of the Karch process and following 1965 published and advocated the infringing system as a novel and innovative new concept in farm soil conservation. The SCS conversion to the Karch process was complete, and paid Karch the supreme flattery of imitating his method. Just as in *U.S. v. Adams*, the federal government copied the product while denying the similarity to the process which it had first ridiculed, here also the SCS expert "gives the tribute of its praise to the prior art" but gives the patent "the tribute of its imitation." *Diamond Rubber Co. v. Consolidated Rubber Tire Co.*, 220 U.S. 428, 433 (1911); and *Charles Peckat Mfg. Co. v. Jacobs*, 178 F.2d 794, 801 (7th Cir. 1949), *cert.den.* 339 U.S. 915 (1950)

Other Secondary Considerations. The SCS overwhelmingly dominates the soil conservation field because of its elaborate financial subsidy program. Karch was virtually alone in obtaining acceptance of experts and highly respected commercial farm managers for a soil conservation process without SCS subsidies. As has been set forth above, bank farm managers, commercial seed

growers, government experts no longer connected with the SCS, and prominent farmers not only testified to the success of the Karch system but paid unreimbursed cash for it, in the face of an abusive use of the power of a governmental monopoly against Karch. This is reminiscent of Mr. Justice Roberts' decision for the Supreme Court in *Goodyear Tire & Rubber Co. v. Ray-O-Vac Co.*, 321 U.S. 275 at 279, 64 S.Ct 593 at 594, 88 L.Ed. 721 (1944), in supporting the validity of a leakproof drycell flashlight battery:

> "Viewed after the event, the means (the inventor) adopted seemed simple and such as should have been obvious to those who worked in the field, but this is not enough to negative invention. During a period of half a century, in which the use of flashlight batteries increased enormously, and the manufacturers of the flashlight cells were conscious of the defects in them, no one devised a method of curing such defect. Once the method was discovered, it commended itself to the public as evidenced by marked commercial success. These factors were entitled to weight in determining whether or not the improvement amounted to invention and should, in a close case, tip the scales in favor of patentability. Accepting . . . we hold the patent valid and infringed."

This commercial success, in Karch's case, was all the more remarkable in view of the monopoly and subsidy powers of his only competitor, the SCS, who throughout the entire period was villifying and ridiculing him and his product. Then, for his sole monopoly competitor to incorporate his idea into their own product, while at the same time, granting subsidies for this competitor to install his idea on his own clients' farms, makes it phenomenal that he was able to remain in business at all (R. 757-760), the SCS even had the

audacity to have a "farm show" of three days of demonstration to area farmers of installation of their infringing process on a farm on which Karch structures had previously been installed. (R. 923-924, 928)

As *Robbins* points out in his seminal article, "Subtests of Non-Obviousness," it is not only the fact that a long-felt need has gone uncorrected, this factor is even more significant when faced with the quality of research, the investment in capital and dollars, the monopolistic position of the researcher, and similar factors in the scope of the art which must be considered in assessing the novelty of the patentee's solution. (U.Pa.L.Rev., at 1172) In this case, that the United States government and its thousands of subsidized researchers had failed to discover the Karch "restricted flow" process is overwhelming in support of the non-obviousness and novel fundamental concept on which Karch obtained his process patent.

> "A finding that no one prior to the patentee had discovered the patented process, in spite of need, and although individual steps of the process were available in other contexts in the art was itself evidence on non-obviousness." *LaSalle Street Press, Inc. v. McCormick and Henderson, Inc.*, 445 F.2d 84, (7th Cir. 1971)

Again, Dr. Ackermann's depiction of the Karch process as "revolutionary and unorthodox" and "distinctly different" from prior research (R. 703), reflects on the failure of others to this point to develop the concept of restricted flow in relationship to farm soil conservation. The *Robbins* article cited aforesaid reflects on "circumvention" as a form of commercial acquiescence. (at 1178-79) As the Supreme Court pointed out, the validity of a patent is bolstered by the commercial success of the patented device, and by the infringer's imitation of it.

Goodyear Tire & Rubber Co., 321 U.S. at 279; *cf. Application of Merg*, 492 F.2d 843 (C.C.P.A. 1974) Robbins points out the unlikelihood of simultaneous invention, particularly where the second claimant knew of the patentee's success (applying with even greater force in the case of a process or method patent, dealing exclusively with an idea), and it is a familiar rule that the prior patents and publications relied upon by the defendant bolster the validity of the patent in suit by illustrating that prior unsuccessful attempts were made to fulfill a long-felt need for a process of soil conservation that would perform efficiently. *Minneapolis-Honeywell Reg. Co. v. Midwestern Inst., Inc.*, 298 F.2d 36, 38 (7th Cir. 1961) In considering the question of obviousness, hindsight is of no value in determining what would have been obvious at the time the invention was made. (*Diamond Rubber Co.*, 220 U.S. at 435).

Accordingly, the Court's "secondary considerations" of *Graham* strongly support the non-obviousness of the Karch patent. Particularly in the light of the *Graham* companion case of *U.S. v. Adams*, the reaction of contemporary specialists in the field, the recognition of the flattery of imitation, the difference of operating characteristics, the unexpectedly new operating characteristics, the known disadvantages of old devices, and the fact that noted experts expressed disbelief in the invention while subsequently experts recognized the significance of the invention and even patterned improvements on the same system, all are elevated from the realm of secondary considerations to primary considerations in determining non-obviousness. (*U.S. v. Adams*, 383 U.S. 51-52)

In view of the overall state of the art, as reflected by both primary and secondary considerations of the

Graham/Adams rule, the trial testimony is overwhelming that the Karch patented method of retarded flow as a process of soil conservation on farm fields was not obvious, but the very opposite—a striking conceptual innovation.

V.

THE UNITED STATES OF AMERICA AS A DEFENDANT IN A PATENT SUIT IS LIABLE FOR TREBLE DAMAGES FOR ACTIVELY INDUCING INFRINGEMENT OF A PATENT UNDER 35 U.S.C., SEC. 271(b).

The Record is replete with documents and facts which show that the defendant repeatedly induced, by documents, financial inducements and through direct contact of agents, the infringement of the Karch patent by hundreds of persons, and were in fact successful in this inducement. In fact, the attorney for the Government attempted to accuse one of the plaintiff's witnesses with contributing to this inducement. (R. 934)

The statutory provision is clear:

> "Whoever actively induces infringement of a patent shall be liable as an infringer." 35 U.S.C. 271(b)

The cases are crystal clear that where the defendant's practice of the method was intimately connected with, and an integral part of, the inducement of infringement of the patent, and the defendant has surreptitiously, willfully and intentionally counterfeited the patent, the patent owner was entitled to an award of treble damages. (*Deyerle v. Wright Mfg. Co.*, (C.C.A. Tenn. 1974) 496 F.2d 45) Although the courts have held that the awards of treble damages for patent infringement are to be made sparingly and only upon a clear showing of deliberate infringement, this has been overwhelmingly shown to be the case in Mr. Karch's very difficult ex-

perience with the United States Government, and the courts have consistently held that treble damages are proper where infringement is wilful, intentional and deliberate. *American Safety Table Co. v. Schreiber* (C.A. N.Y., 1969) 415 F.2d 373, *cert.den.* 90 S.Ct. 683, 396 U.S. 1038, 24 L.Ed.2d 632.

VI.

THE UNITED STATES OF AMERICA, BY THE ACTS OF ITS AGENTS IN GRANTING A PATENT, IS ESTOPPED FROM PURSUING COLLATERALLY THE ISSUE OF NON-VALIDITY OF THE PATENT, AND THE DOCTRINE OF *RES JUDICATA* IS APPLICABLE.

As set forth in the motion *in limine* to prohibit testimony on grounds of estoppel, agents of the United States having conducted an exhaustive and extensive patent search and examination prior to the granting of the Karch patent herein, the issuance of the patent and the determination of validity thereon should and does estop and bar the United States Government from interjecting and pursuing said issues collaterally in a proceeding in which the United States Government is now a party-defendant. The doctrine of *res judicata* is applicable to decisions of Patent Office tribunals. *Application of Drutton*, 205 F.2d 198, 40 C.C.P.A., *Patents*, 1079 (1953) U.S. Constitution, Art. 1, Sec. 8, Clause 8.

CONCLUSION

The foregoing amply demonstrates that the Court of Claims erred in interpreting this Court's factors for evaluating validity of a patent under the obviousness provisions of 35 U.S.C. Sec. 103. Particularly, the Court failed to recognize that in the Karch patent, a process or method patent, the *rate of flow* is a critical new step in the process which accomplishes the desired result.

Although the Court recognizes the novelty of the Karch process, and correctly finds that the prior art does not anticipate the Karch patented method under 35 U.S.C., Sec. 102, the Court below fails to recognize that an admittedly novel, critical step in a process patent must as a matter of law be non-obvious if it is totally unmentioned in the prior art.

The "revolutionary and unorthodox" nature of the Karch patent, as recognized by Dr. Ackermann, consisted in the patent's reconciliation of two seemingly opposite methods of handling soil conservation by drainage of normal rainfall from farm fields.

That the wisdom of hindsight makes the Karch process seem deceptively simple does not hide the fact that the contribution was distinctly different from all prior art, and a major breakthrough in the concept of handling rainwater to prevent erosion.

The unusual and dramatically different nature of the Karch patented process is especially reflected in the reaction of government experts, who at first scoffed and ridiculed, then actively opposed and sought to undermine the commercial success of the Karch patent through misuse of their government positions. Nevertheless, when it became apparent that the Karch process

had the approval of private experts in the field, and many enthusiastic users, and had been glowingly reported in farm and engineering periodicals, the government officials not only copied the Karch patent, giving it the flattery of their imitation, but also purported publicly and in print to have originated the Karch *rate of flow* restriction concept.

For all of these reasons, the petition for writ of certiorari should be granted, and the case reversed, with summary judgment entered for the plaintiff, or, in the alternative, the case remanded for further hearings on the merits herein, with appropriate directions from this Court and with the requirement of full compliance with the letter and spirit of the Constitution and Statutes.

Respectfully submitted,

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APPENDIX

APPENDIX

In the United States Court of Claims

No. 298–69

(Decided December 14, 1977)

KREKEL KARCH v. THE UNITED STATES

John E. Juergensmeyer, attorney of record, for plaintiff. *Juergensmeyer, Zimmerman & Smith, John Carlon* and *Carlon and Carlon*, of counsel.

Frank R. Perillo, with whom was *Assistant Attorney General Barbara Allen Babcock*, for defendant.

Before COWEN, *Senior Judge*, DAVIS and KUNZIG, *Judges*.

OPINION

PER CURIAM: Trial Judge Colaianni has decided that plaintiff's patent relating to erosion and flood control and land reclamation is invalid for obviousness. Plaintiff has excepted to that determination. The court has considered the briefs and oral argument, and now adopts the trial judge's opinion (with minor modifications) as hereinafter set forth, as the basis for its judgment in the case.* Accordingly, it is concluded that plaintiff is not entitled to recover and the petition is dismissed.

* While the court adopts the trial judge's separate findings of fact, as set forth in his report filed January 27, 1977, they are not printed herein since such facts as are necessary to the decision are contained in the opinion set forth *infra*.

Trial Judge Colaianni's opinion, with minor modifications, is as follows:

COLAIANNI, *Trial Judge:* Charging that the United States has used the invention covered by his patent, entitled "Erosion and Flood Control and Land Reclamation," without his consent or authorization, plaintiff brings this action pursuant to 28 U.S.C. § 1498 for reasonable and entire compensation. Trial was limited to the issues of patent validity and infringement. The amount of plaintiff's recovery, if any, is deferred until after a final ruling by this court on the questions of validity and infringement.

The patent in suit, United States Patent No. 2,745,768, hereinafter referred to as the "Karch" patent, issued on May 15, 1956,[1] to Krekel Karch, who throughout its term was the sole owner of all right, title and interest therein.

Defendant denies plaintiff's claim on various grounds, including that the claimed process was known or used in public, or described in a printed publication within the meaning of 35 U.S.C. § 102(a),[2] more than 1 year prior to the date of plaintiff's invention. In addition, defendant urges that the invention was obvious to one of ordinary skill in the art and thus invalid for failure to meet the standard of 35 U.S.C. § 103.[3] Finally, defendant maintains that it is not liable to plaintiff because it has not used the process covered by the single process claim of the Karch patent during the relevant accounting period.

For the reasons stated hereinafter, it is concluded that the patent in suit is invalid since the process would have

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[1] The term of a patent is 17 years; accordingly, the Karch patent expired on May 15, 1973.

[2] "§ 102. Conditions for patentability; novelty and loss of right to patent

"A person shall be entitled to a patent unless—

"(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or"

[3] "§ 103. Conditions for patentability; non-obvious subject matter

"A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made. * * *."

been obvious to one of ordinary skill in the art at the time that plaintiff made his invention.

The Karch Patent

The Karch patent relates to erosion and flood prevention and control, and, as well, to the reclamation of land which has been damaged by the failure of a landowner to practice necessary water control measures. Briefly stated, the method employes the well-known concept of slowing the velocity of silt-laden water to such a degree and for such a length of time, that a large proportion of the silt will be deposited. A substantial proportion of the desilted water is soaked up by the terrain to increase the land's water table, while the remainder harmlessly passes along its normal flow course. In order to collect and otherwise slow the velocity of the silt-laden water, a barrier is constructed across a gully that is to be eradicated. In this manner, a dry basin is formed behind or upstream of the barrier. Prior to forming the barrier, a horizontal conduit has been placed such that it will ultimately be positioned transversely below the barrier. The inlet of the conduit is placed at approximately the lowest level of the dry basin, while the outlet may discharge into another dry basin, stream, or lake.

The arrangement is such that in times of rainfall water will flow rapidly down the gully, at a velocity that is dependent upon such factors as the amount of rainfall and the slope of the gully. The water carries in suspension soil or silt washed from the land drained by the gully. Upon the silt-laden water initially reaching the barrier, its movement will be interrupted and a pool will be formed in the basin. The slowing of the water results in the deposition of suspended silt. As additional water enters the basin, it encounters the water previously collected and in turn is sufficiently slowed so that its silt will be deposited on the floor of the gully at the point on the periphery of the water present in the basin where the additional silt-laden water enters. As additional water is collected, the periphery of the pool is continuously changing, so that successive

increments of silt will be deposited at the everchanging water periphery.

The water which is collected in the basin will be discharged by way of the conduit. However, the conduit inlet can be restricted so that the rate of discharge through the conduit is substantially less than the normal rate of flow into the basin. In this manner, even normal rains will cause a pool or lake to be formed temporarily in the dry basin. In the event that the dry basin is being cultivated, the design is such that the accumulated water will be emptied from the basin within ½ to 2 days and thus prevent damage to the crop. In order to ensure that an inlet small enough to cause a temporary lake in the basin in light rains will nonetheless empty the basin within 2 days of heavy rains, a spillway is provided to carry around the barrier that water which is in excess of the volume which the inlet can handle in this period.

In operation, the silt will initially fill the irregularities on the floor of the basin. However, as a result of repeated depositions of silt, the floor of the basin will be built up. It therefore will become necessary, as the process continues, occasionally to raise the inlet end of the conduit to ensure that the inlet level is level with or slightly above the accumulated silt level which has become the floor of the dry basin.

The Patent Claim

The single method claim of the Karch patent, in indented form for ease of understanding, reads as follows:

> The method of stopping erosion by silt-containing water flowing in a gully, and causing deposition of silt therefrom, comprising:
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> erecting a water barrier across said gully to provide a temporary retaining basin for at least some of said water, said barrier comprising a conduit positioned substantially horizontally beneath and transversely of said barrier, the inlet of said conduit being at the lowest point in the basin;
> providing a spillway near one end of said barrier of lower elevation than the top of said barrier;

> receiving silt-containing water in said basin; causing water to collect in said basin by discharging water from the floor of said basin solely through said conduit at a flow volume substantially less than that at which water enters said basin, and thereby causing deposition of silt from said water on the floor of said basin, in substantially successive increments at the ever-changing water periphery; and
> continuously discharging desilted water from said conduit until said basin is empty;
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> whereby erosion in said gully is eliminated and said basin is thereafter operable as a safely cultivatable dry basin, wherein the basin floor slopes upwardly from the conduit level to the ultimate silt level.

Scope of the Claim

Defendant has contended that major flood control projects built by the Government since the 1920's[4] anticipate the Karch claim and thus render it invalid for lack of novelty pursuant to 35 U.S.C. § 102. Such projects were primarily concerned with the formation of temporary lakes in rains so heavy, i.e., 2, 5, 10, or 50-year storms,[5] that flood prevention measures become appropriate. The flood control structures were not intended and indeed did not result in the formation of temporary lakes in what may be termed a normal or typical rain. Rather, the flood control dams were designed to retain the high levels of water resulting from the unusual storms and thus prevent rivers from overflowing their banks and causing loss of life and property. The retained water would thereafter be discharged at a metered rate which could be conveniently and safely accommodated by the river.

Plaintiff, to the contrary, contends that methods whose utility is limited to unusual heavy rain conditions are not within the Karch method. The Karch method, plaintiff contends, is limited to the collection of silt in normal,

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[4] In particular, defendant points to the Miami Conservancy Project near Dayton, Ohio, and the Little Sioux Project in Woodbury and Monona Counties of Iowa.

[5] These are storms of such duration and intensity that past experience has shown that on the average they will occur respectively only once in a 2, 5, 10, or 50-year period.

everyday intensity rains. The large scale, heavy rains cannot be retained by the water barrier of the method in suit, but instead flow over or around the barrier by way of the spillway.

Looking to the Karch specification to determine the context in which the claims are to be read, one finds:

> This conduit is so designed that the rate of flow through it is substantially less than the normal rate of flow of water into the basin.
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> • • •
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> • • • Thus, if the conduit has been made too large, any simple, conventional arrangement can be made to reduce the area of the inlet opening, so that normal rainfalls will result in the formation of a temporary lake in the dry basin.

As explained by the patent specification, in heavy rains, Karch's spillway carries silt-containing water around the structure and thus the Karch method is ineffective to collect silt from a large proportion of the water that reaches the barrier in heavy rains.

Looking to the specification of a patent to determine the metes and bounds of a claim is a longstanding practice which is resorted to by all courts, including the Supreme Court, which in *Motion Picture Patents Co.* v. *Universal Film Mfg. Co.*, 243 U.S. 502, 510 (1917), noted that "[t]he scope of every patent is limited to the invention described in the claims contained in it, read in light of the specification." The Supreme Court recently restated and reemphasized this principle in *United States* v. *Adams*, 383 U.S. 39, 49, 148 USPQ 479, 482 (1966), where it stated: "[I]t is fundamental that claims are to be construed in the light of the specification and both are to be read with a view of ascertaining the invention." It is, accordingly, concluded that the Karch method is limited to methods which function in normal rains, and excludes those methods which function only in heavy rain or flood situations.

Defendant's 35 U.S.C. § 102 Defenses

Reading the Karch method, as we must, to be ineffective in heavy rain situations, emasculates defendant's 35 U.S.C.

§ 102 arguments. Specifically, each of the flood control projects relied upon, i.e., the Little Sioux Project in Iowa, the Germantown and Huffman Dams in the Miami Conservancy District, Farmers' Bulletin No. 1234, published by the U.S. Department of Agriculture, and, as well, the soil-saving dry dam on the Rollene Farm in Iowa, fail to disclose each and every step of the claimed invention or obtain the same result as the Karch method.

While in unusual and heavy rain situations some silt may be collected behind these dams, the collection at best occurs only rarely and most often only after a 2, 5, 10, or 50-year storm. The above projects were undeniably not intended to collect silt and operate in the manner proposed by the Karch method for the normal everyday rains. In fact, the openings or conduits used to carry the pooled water under the barriers of these flood control projects are of such dimensions that a temporary pond or pool cannot occur except in unusual 2, 5, 10, or 50-year storms.

While it is true that the builders of the dams and flood control projects realized that silt would be collected in cloud-bursting-type rains, the collection of silt was not desired or intended and was only an accidental by-product of their immediate goal of flood control. To the contrary, Karch intended his method to be effective to desilt water that drains into a gully from an average or typical everyday rain.

It must, accordingly, be concluded that the incidental and occasional collection of silt by the flood control projects cited by defendant do not operate in the manner required of the claim in suit, and thus do not anticipate within the meaning of 35 U.S.C. § 102(a).

Defendant's 35 U.S.C. § 103 Defense

In addition to its position that the Karch patent is anticipated by certain prior art and thus invalid for lack of novelty, defendant also argues that the patent is obvious in view of the prior art and thus invalid and unenforceable.

In evaluating validity under 35 U.S.C. § 103, it is necessary to consider the following three factors:

(1) the scope of the prior art;

(2) the differences between the prior art and the claims in issue; and

(3) the level of ordinary skill in the art.

Further secondary considerations, such as commercial success, satisfying a long-felt need, or the failure of others, reflect upon the determination of obviousness under 35 U.S.C. § 103. *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966).

It is, of course, essential in evaluating an invention against the standards of 35 U.S.C. § 103 that hindsight and the disclosure of the patent in suit not be resorted to. *See Jamesbury Corp.* v. *United States*, 207 Ct.Cl. 516, 542, 518 F.2d 1384, 1398 (1975). Adherence to that principle is assured in this instance since all the steps of the Karch method, or the motivation for a person skilled in the art to supply the missing steps, are present in the prior art.

After reviewing the differences between the prior art and the claim, the level of ordinary skill in this art, and the scope of the prior art, and after noting that such secondary considerations as are present here are insufficient to outweigh these factors, it becomes clear that the Karch patent is invalid under 35 U.S.C. § 103.

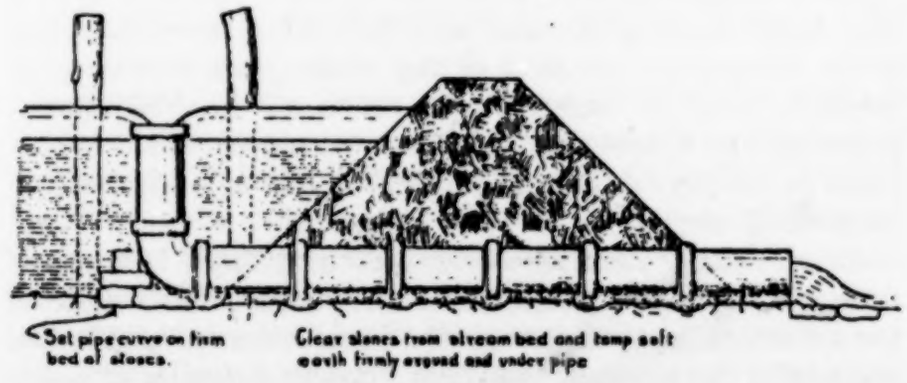
Scope of the Prior Art

As explained by the Farm Division of the Miami Conservancy District, in The Beneficial Effect of Backwater Overflow, Farm Circular No. 2 (1919), the improved fertility of farm fields resulting from the presence of silt deposited in times of flood has long been recognized. In addition to the recognition by the art of the benefits of silt, the desirability and the feasibility of collecting it on farm fields has also been a long-standing practice as explained by the following publications: The Beneficial Effect of Backwater Overflow, *supra*; Texarkana Pipe Co., Vitrified Clay Sewer Pipe and Drain Tile on the Farm (circa 1920); U.S. Department of Agriculture, Farmers' Bulletin No. 1234 (1923); R.H. Sparks, United States Patent No.

1,083,148 (1913); and U.S. Department of Agriculture, Farmers' Bulletin No. 1669 (1931).

Further, the following publications show the recognition by the art of collecting silt to fill erosion gullies in fields: Farmers' Bulletin No. 1234, *supra*; and Vitrified Clay Sewer Pipe and Drain Tile on the Farm, *supra*. Farmers' Bulletin No. 1669, *supra*, also teaches the value of retaining silt on farm terraces.

Structures for collecting silt are shown in both Vitrified Clay Sewer Pipe and Drain Tile on the Farm, *supra*, at 2 and 7–9, and in Farmers' Bulletin No. 1234, *supra*, at 23. In each of these structures an earthen barrier is placed across the gully or depression to be filled with sediment. Silt-containing water flows down the gully and is collected behind the barrier. A layer of silt is left behind as the collected water soaks into the soil and previously-collected sediment. A drop inlet which is about 2 or 3 feet below the top of the dam functions as an emergency spillway to limit the height of the water. When the height of the water in the basin exceeds the height of the drop inlet, the excess flows into the drop inlet and is carried through a horizontal sewer pipe that extends beneath and transversely of the earthen barrier substantially as shown hereinbelow:



Lengthwise section of gulley showing cross section of earth dam and installation of vitrified clay sewer pipe underflow.

Further, the Vitrified Clay Sewer Pipe and Drain Tile on the Farm article, *supra*, at 11, teaches that in some

climates and under certain conditions of soil, the basin behind the dam will be too wet to cultivate. It thus becomes necessary to remove the water trapped in the basin more quickly. The article suggests placing a line of drain tile below the earth to collect and remove the water from the saturated soil.

Also part of the prior art is the previously-mentioned structure built by the Soil Conservation Service on the Rollene farm, Franklin County, Iowa, in 1950 for the purpose of stopping the advance of an erosion gully. The Rollene farm illustrates another method for removing the water from behind an earthen barrier. The structure consists of an earthen barrier across a gully with a 12" tile drain passing beneath it. The tile is supplied by an 18" drop inlet located at the lowest point of a basin. An auxiliary spillway to carry off excessive amounts of water and thus prevent damage to the barrier is also provided near one of its ends. It appears that the Rollene structure successfully eliminated erosion in the gully by slowing the water that flows in the gully from an 85-acre watershed. Due to the successful operation of the barrier, grass is now growing in the gully downstream of the barrier, and the upstream basin has not been washed away even in very hard rains.

Even though the 18" drop inlet is too large to enable a pool from forming in the basin in normal everyday-type rains, temporary ponding of the water does occasionally occur in heavier rains. As a result of this occasional ponding, 3 to 6-acre feet of silt have been collected in the basin in the period from 1950 to 1975. This amount of silt is considered negligible for this structure.

As previously mentioned, the 18" drop inlet is so large that it is able to accommodate the water which collects from most rains even though the barrier serves an 85-acre watershed. As a result, temporary ponding occurs, at most, only two or three times a year. The normal everyday-type rains are removed from the basin so quickly that silt is not given time to deposit. In order to cause a temporary pond which takes 12 hours to drain, for example, it is necessary to have a rain of a 10-year intensity on the Rollene farm.

The Differences Between the Prior Art and the Claim

In the main, the method illustrated by Vitrified Clay Sewer Pipe and Drain Tile on the Farm, *supra*, differs from the Karch method only in the rate and structure by which the water is removed from the basin. This prior art method appears to rely upon water soaking into the soil to remove the water. The soaking process may require a long period of time to complete and the ground in the meantime may become soggy. This prior art reference also does not show an inlet into the tile conduit at the lowest point of the basin or a spillway near one end of the barrier.

On the other hand, the Rollene structure contains most of the ingredients required by the Karch method, including an inlet into the tile conduit at the lowest point of the basin and a spillway near one end of a barrier at a lower elevation than the top of the barrier. As a result, the water flowing into the basin passes, by way of the inlet, into the horizontal conduit below the barrier. However, the Rollene method is designed for heavy rains, and since the ratio of the inlet size to the watershed it services is much larger than in the Karch method, the method does not collect silt in the normal rain situation as required by the Karch claim.

Level of Ordinary Skill

A review of the prior art demonstrates that one of ordinary skill in this art fully appreciates the properties of silt and the beneficial effect of having silt deposited upon his fields. As pointed out in The Beneficial Effect of Backwater Overflow on Agricultural Lands, *supra*, silt has long been recognized as a worthwhile fertilizer. The pamphlet states that lands subject to periodic submergence are generally the richest. Further, it points out that such lands maintain their great fertility without crop rotation or application of manure or other fertilizers. Indeed, fields subject to the deposition of silt are often more productive than fields to which manure and other fertilizers are artifically applied. Accordingly, one of ordinary skill in the

farming arts wishing to use his fields to produce crops would obviously encourage the deposition of silt on his fields.

The documents of record also convincingly demonstrate that the prior art recognized that the amount of silt which can be carried by water is proportional to its speed. Thus, as the speed of flowing water increases silt is picked up and as the speed decreases silt is deposited. Silt is deposited most thoroughly and quickly from water which has been temporarily retained in a standing pool as in the example discussed and illustrated in the Vitrified Clay Sewer Pipe and Drain Tile on the Farm pamphlet, *supra*.

Moreover, it was equally well known that water standing on crops for too long a period will damage the crops. A trade-off between the desire of having the water stand in the basin for a long period of time in order to recover as much of the silt as possible on the one hand, and, on the other hand, the desire of removing the water from planted fields to avoid crop damage would obviously be recognized by a person of ordinary skill in the art.

Thus, if in using the Vitrified Clay Sewer Pipe and Drain Tile on the Farm, *supra*, method and structure for the desilting of rainwater it turned out that the land was too soggy for cultivation, it is obvious that ways for draining the water off the land more quickly would be resorted to. One way, the way suggested by the Rollene farm, is to provide an inlet to the tile buried beneath the barrier at the lowest point of the basin. Further, keeping in mind the desired goal of achieving maximum desilting without crop damage, one of ordinary skill would obviously make the drop inlet small enough to cause temporary ponding and desilting for normal rains, but large enough to remove the water before crop damage set in.

Thus, one of ordinary skill in the farming arts following the suggestions of Vitrified Clay Sewer Pipe and Drain Tile on the Farm, *supra*, for cultivating the land covered by silt deposited behind a soil-saving dam, would find it obvious to place an inlet to the tile system at the lowest point of the basin as taught by the Rollene structure to dispell a boggy condition. Further, such person would make the inlet small

enough to cause the formation of a temporary pool to maximize the desilting operation, but not so small that the water would be retained so long that damage to the crops occurs. Accordingly, all of the steps called for by the Karch method would have been obvious, within the meaning of 35 U.S.C. § 103, to a person of ordinary skill in the art.[4]

CONCLUSION

Based on the above analysis, it must be concluded that claim 1, the only claim of the Karch patent, is invalid and unenforceable. The issue of infringement need not be addressed. Plaintiff is not entitled to recover, and his petition is dismissed.

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[4] Plaintiff stresses a number of alleged secondary considerations (commercial success in central Illinois where plaintiff lives; past failures of others; contemporaneous reactions of experts; purported satisfaction of a long-felt need of farmers) but, here as in *Graham* v. *John Deere Co.*, *supra*, 383 U.S. at 36, "these factors do not, in the circumstances of this case, tip the scales of patentability." It is settled that where obviousness is clear (as in the present case), such secondary considerations cannot turn invalidity into validity. *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.*, 396 U.S. 57, 61 (1969); *Sakraida* v. *Ag Pro, Inc.*, 425 U.S. 273, 282–83 (1976). Moreover, just as in *Graham* v. *John Deere Co.*, *supra*, the favorable reception of plaintiff's alleged invention may have been due to the fact that the enthusiasts were not adequately aware of the knowledge stored in the Patent Office and other repositories of the prior art. Nor has plaintiff proved that such success as he obtained was due to his particular claimed contribution, not to other factors. *See Bourns, Inc.* v. *United States*, 210 Ct. Cl. 642, 658–59, 537 F.2d 486, 495 (1976); *Jacobson Bros.* v. *United States*, 206 Ct. Cl. 518, 531–32, 512 F.2d 1065, 1072–73 (1975). [footnote by the court]